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*Diary*

DEPARTMENT OF THE INTERIOR

INFORMATION

RESPECTING THE

YUKON DISTRICT

FROM THE

REPORTS OF WM. OGILVIE

DOMINION LAND SURVEYOR

AND FROM OTHER SOURCES



OTTAWA  
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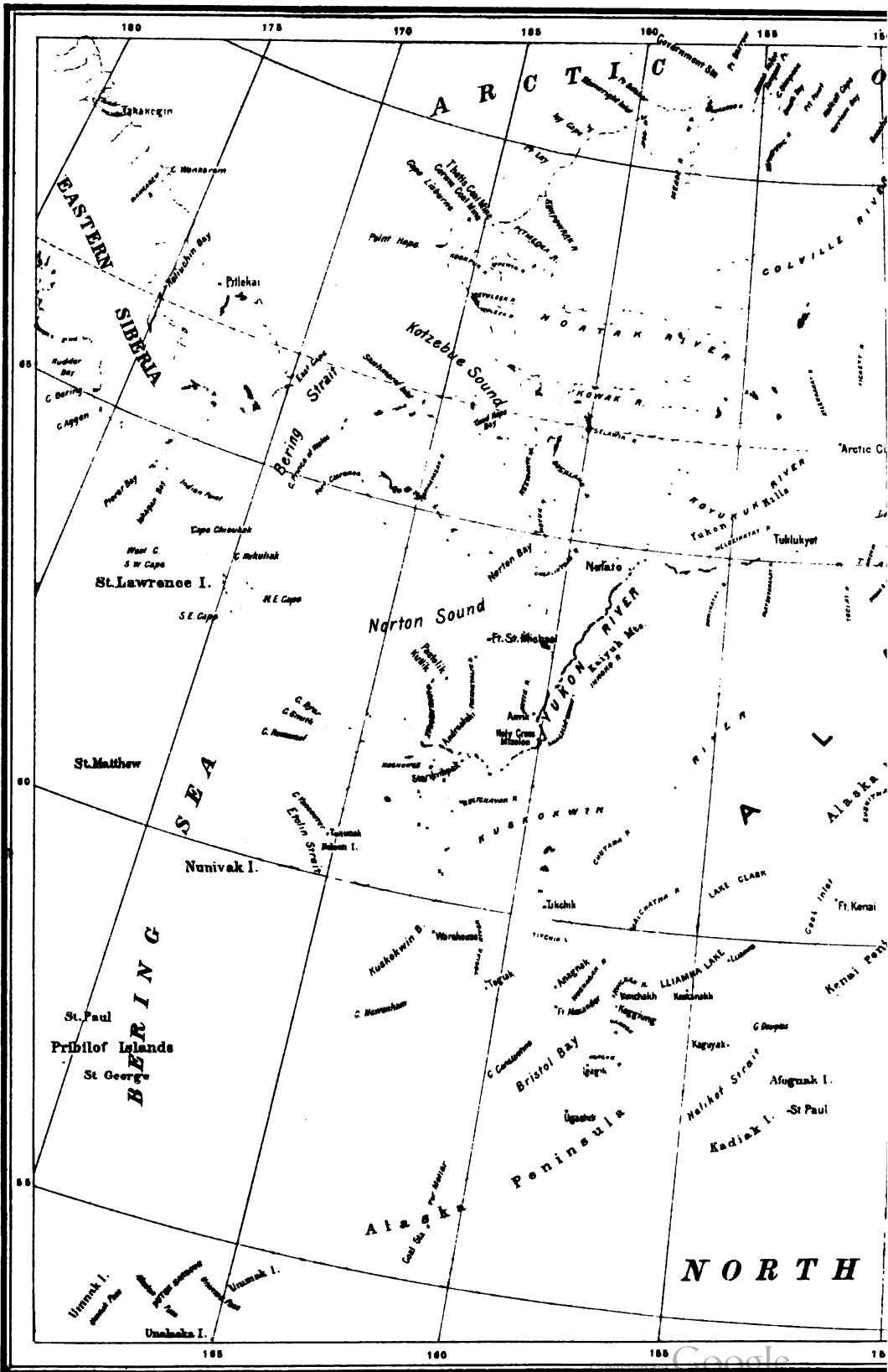
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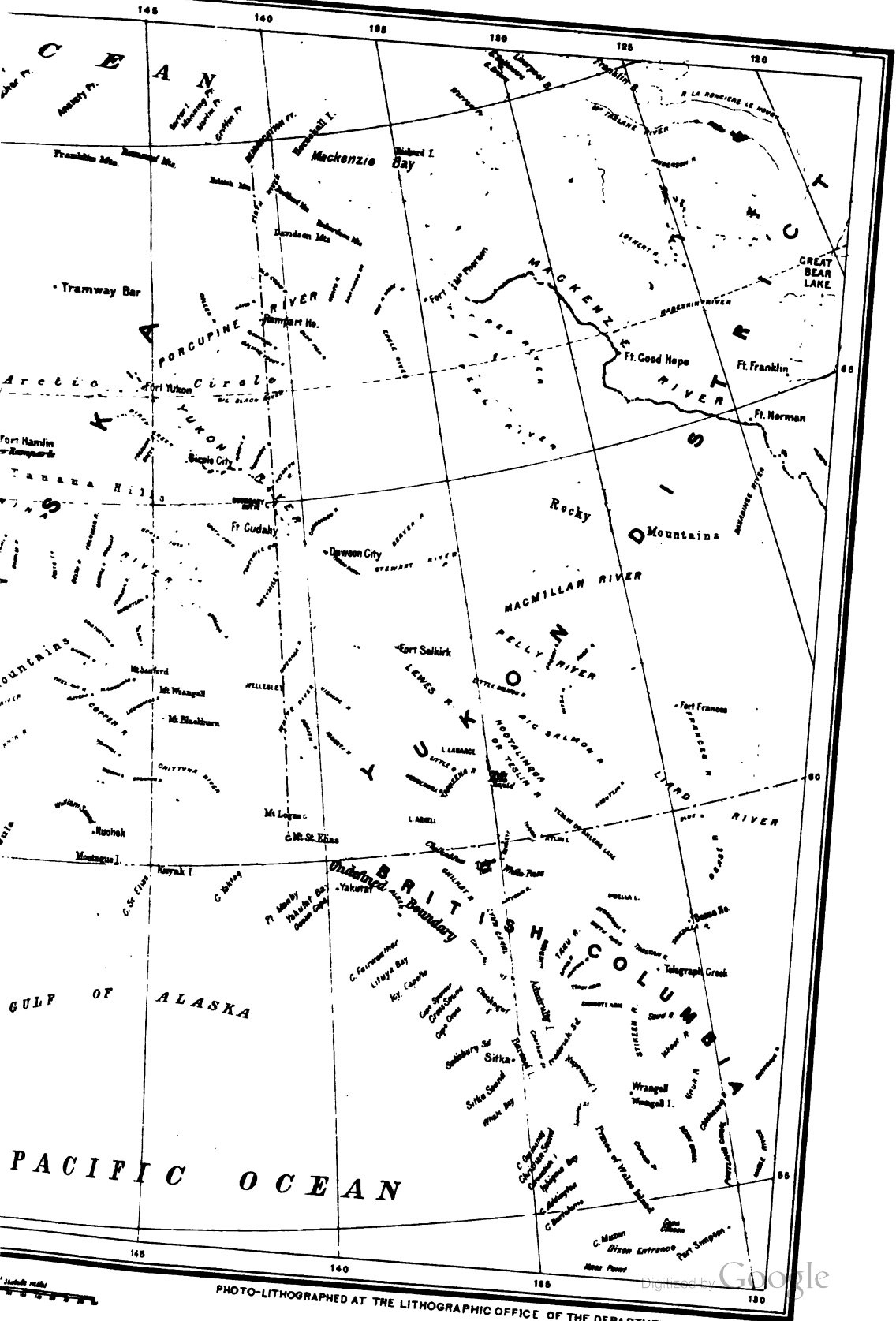
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C. R. V.

# THE YUKON RIVER



# AND ITS TRIBUTARIES







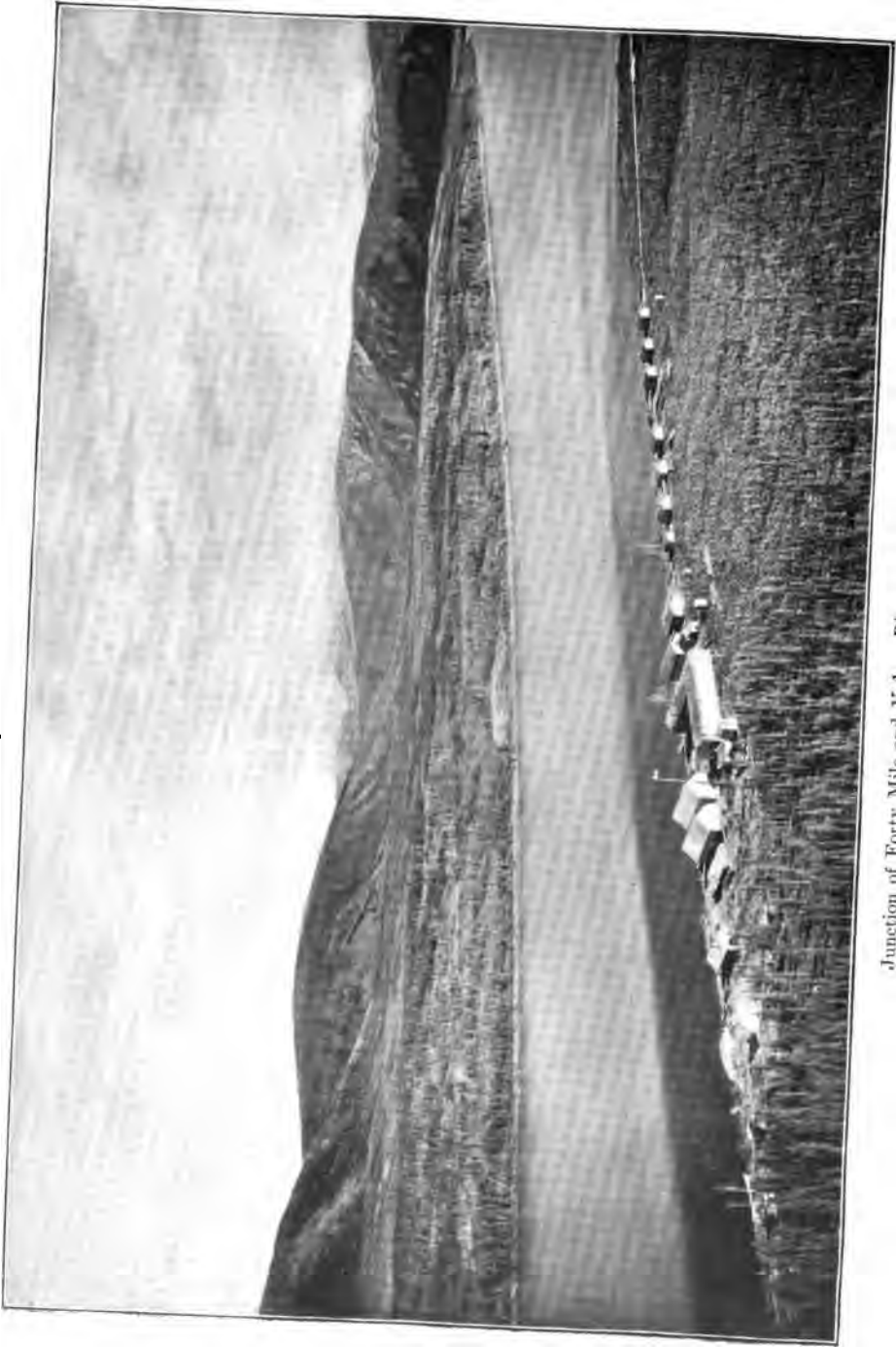
Fort Constantine.

Forty Mile Town.



Junction of Forty Mile and Yukon Rivers (right hand view).





Junction of Forty Mile and Yukon Rivers (left hand view).





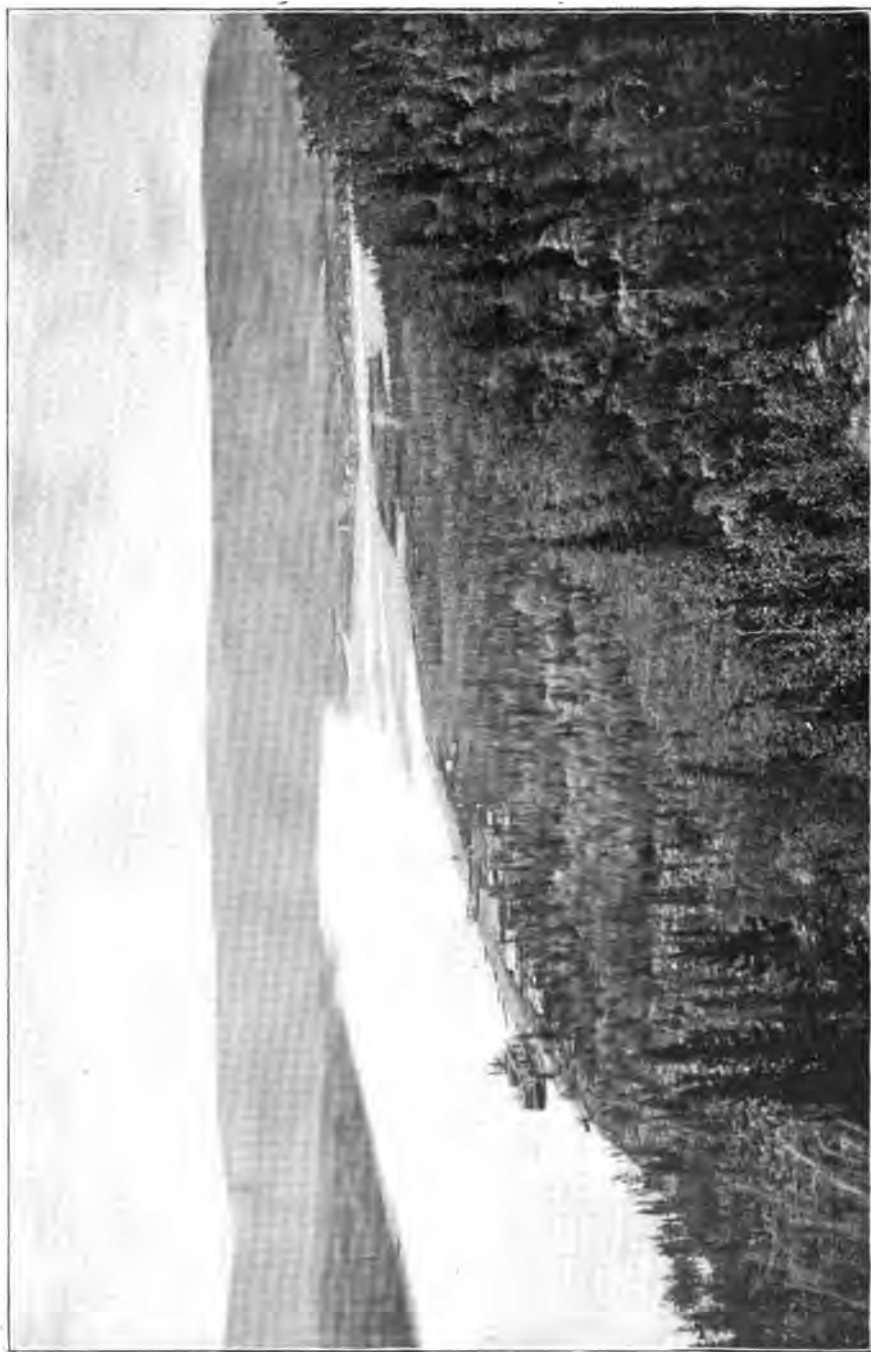
Forty Mile Town.





Str. "P. B. Weare." Cudahy.

Fort Constantine. Forty Mile Town.



Junction of Forty Mile and Yukon Rivers.



DEPARTMENT OF THE INTERIOR

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## NOTE.

The following notes on the Yukon District consist principally of information furnished by William Ogilvie, Dominion Land Surveyor, and are published in reply to numerous calls from the public for his report. The object is not to induce any one to go to that remote country at the present time; until better means of communication are established, a man undertakes serious risks in going there unless he has sufficient resources to tide over the long winter. After September, egress from the country is practically impossible until the following June, and a person who has not been successful in locating a paying claim has to depend for his subsistence upon finding employment. Wages are at times abnormally high, but the labour market is very narrow and easily overstocked. It is estimated that up to the middle of May 1,500 to 1,600 people had crossed the Taiya Pass this year; several hundred more will go by steamer up the Yukon. Whether employment will be available for all and for the considerable population already in the district is somewhat doubtful; it will therefore be wise for those who contemplate going to the Yukon District to give serious consideration to the matter before coming to a decision.

E. D.

DEPARTMENT OF THE INTERIOR,  
OTTAWA, 8th June, 1897.

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## APPROXIMATE DISTANCES TO CUDAHY.

### VIA ST. MICHAEL.

	Miles.
San Francisco to Dutch Harbour.....	2,400
Seattle or Victoria to Dutch Harbour.....	2,000
Dutch Harbour to St. Michael.....	750
St. Michael to Cudahy.....	1,600

### VIA TAIYA PASS.

Victoria to Taiya.....	1,000
Taiya to Cudahy.....	650

### VIA STIKINE RIVER.

Victoria to Wrangell.....	750
Wrangell to Telegraph Creek.....	150
Telegraph Creek to Teslin Lake.....	150
Teslin Lake to Cudahy.....	650

### DISTANCES FROM HEAD OF TAIYA INLET.

Head of canoe navigation, Taiya River.....	5·90
Forks of Taiya River.....	8·38
Summit of Taiya Pass.....	14·76
Landing at Lake Lindeman.....	23·06
Foot of Lake Lindeman.....	27·49
Head of Lake Bennet.....	28·09
Boundary line B. C. and N. W. T. (Lat. 60°).....	38·09
Foot of Lake Bennet.....	53·85
Foot of Caribou Crossing (Lake Nares).....	56·44
Foot of Tagish Lake.....	73·25
Head of Marsh Lake.....	78·15
Foot of Marsh Lake.....	97·21
Head of Cañon.....	122·94
Foot of Cañon.....	123·56
Head of White Horse Rapids.....	124·95
Foot of White Horse Rapids.....	125·33
Tahkeena River.....	139·92
Head of Lake Labarge.....	153·07
Foot of Lake Labarge.....	184·22
Teslinto River.....	215·88
Big Salmon River.....	249·33
Little Salmon River.....	285·54
Five Finger Rapids.....	344·83
Pelly River.....	403·29
White River.....	499·11
Stewart River.....	508·91
Sixty-Mile Creek.....	530·41
Dawson City.....	575·70
Fort Reliance.....	582·20
Forty-Mile River.....	627·08
Boundary Line.....	667·43

# THE YUKON DISTRICT

## HISTORICAL SKETCH

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The Yukon District comprises, speaking generally, that part of the North-west Territories lying west of the water shed of the Mackenzie River; most of it is drained by the Yukon River and its tributaries. It covers a distance of about 650 miles along the river from the coast range of mountains.

The first people from civilization to enter the country were the traders for the Hudson's Bay Company. In the year 1840 Mr. Campbell was commissioned by Sir George Simpson to explore the Upper Liard and to cross the height-of-land in search of any river flowing to the westward. After ascending the river to its head waters he struck across to the head of the Pelly River, thence down the Pelly to the confluence of the Lewes, at which point he turned back, his men having become discouraged by the stories of the Wood Indians encamped there, who represented that the lower portion of the river was inhabited by a large tribe of cannibals. In 1847 Fort Yukon was established at the mouth of the Porcupine by Mr. A. H. Murray another member of the Hudson's Bay Company.

In 1848 Campbell established Fort Selkirk at the confluence of the Pelly and Lewes Rivers; it was plundered and destroyed in 1852 by the Coast Indians, and only the ruins now exist of what was at one time the most important post of the Hudson's Bay Company to the west of the Rocky Mountains in the far north. In 1869 the Hudson's Bay Company's officer was expelled from Fort Yukon by the United States Government, they having ascertained by astronomical observations that the post was not located in British territory. The officer thereupon ascended the Porcupine to a point which was supposed to be within British jurisdiction, where he established Rampart House; but in 1890 Mr. J. H. Turner of the United States Coast Survey found it to be 20 miles within the lines of the United States. Consequently in 1891 the post was moved 20 miles further up the river to be within British territory.

The next people to enter the country for trading purposes were Messrs. Harper and McQuestion. They have been trading in the country since 1873 and have occupied numerous posts all along the river, the greater number of which have been abandoned. Mr. Harper is now located as a trader at Fort Selkirk, and Mr. McQuestion is in the employ of the Alaska Commercial Company at Circle City, which is the distributing point for the vast regions surrounding Birch Creek, Alaska. In 1882 a number of miners entered the Yukon country by the Taiya Pass; it is still the only route used to any extent by the miners, and is shorter than the other passes though not the lowest. In 1883 Lieutenant Schwatka crossed this same pass and descended the Lewes and Yukon Rivers to the ocean.

The history of the Yukon District within recent years will be best described by the following extract from the annual report of the Deputy of the Minister of the Interior for the year 1895 :—

"In the year 1887 the Hon. Thomas White, then Minister of the Interior, authorized the organization of an expedition having for its object the exploration of that region of the North-west Territories of Canada which is drained by the Yukon River. The work was entrusted to Dr. George M. Dawson, now the Director of the Geological Survey, and Mr. Wm. Ogilvie, the well known explorer and surveyor. Dr. Dawson devoted the whole of that season, and Mr. Ogilvie a period covering nearly two years, to obtaining geological, topographical, and general information, chiefly respecting the tract of country lying adjacent to the 141st meridian of longitude, which by the Treaty of St. Petersburg is designated as the boundary line from the neighborhood of Mount St. Elias to the Arctic Ocean between Alaska and the adjoining possessions of the British Crown which now form part of the North-west Territories of Canada.

"The explorers found that in proximity to the boundary line there existed extensive and valuable placer gold mines, in which even then as many as three hundred miners were at work. Mr. Ogilvie determined, by a series of lunar observations, the point at which the Yukon River is intersected by the 141st meridian, and marked the same on the ground. He also determined and marked the point at which the western affluent of the Yukon, known as Forty Mile Creek, is crossed by the same meridian line, that point being situated at a distance of about twenty-three miles from the mouth of the creek. This survey proved that the place which had been selected as the most convenient, owing to the physical conformation of the region, from which to distribute the supplies imported for the various mining camps, and from which to conduct the other business incident to the mining operations—a place situate at the confluence of the Forty Mile Creek and the Yukon, and to which the name of Fort Cudahy has been given—is well within Canadian territory. The greater proportion of the mines then being worked Mr. Ogilvie found to be on the Canadian side of the international boundary line, but he reported the existence of some mining fields to the south, the exact position of which with respect to the boundary he did not have the opportunity to fix.

"The number of persons engaged in mining in the locality mentioned has steadily increased year by year since the date of Mr. Ogilvie's survey, and it is estimated that at the commencement of the past season not less than one thousand men were so employed. Incident to this mineral development there must follow a corresponding growth in the volume of business of all descriptions, particularly the importation of dutiable goods, and the occupation of tracts of the public lands for mining purposes which according to the mining regulations are subject to the payment of certain prescribed dues and charges. The Alaska Commercial Company, for many years subsequent to the retirement of the Hudson's Bay Company, had a practical monopoly of the trade of the Yukon, carrying into the country and delivering at various points along the river, without regard to the international boundary line or the customs laws and regulations of Canada, such articles of commerce as were required for the prosecution of the fur trade and latterly of placer mining, these being the only two existing industries. With the discovery of gold, however, came the organization of a competing company known as the North American Transportation and Trading Company, having its headquarters in Chicago and its chief trading and distributing post at Cudahy. This company has been engaged in this trade for over three years, and during the past season despatched two ocean steamers from San Francisco to St. Michael, at the mouth of the Yukon, the merchandise from which was, at the last mentioned point, transhipped into river steamers and carried to points inland, but chiefly to the company's distributing centre within Canadian territory. Importations of considerable value, consisting of the immediately requisite supplies of the miners, and their tools, also reach the Canadian portion of the Yukon District from Juneau, in the United States, by way of the Taiya Inlet, the mountain passes, and the chain of waterways leading therefrom to Cudahy. Upon none of these importations had any duty been collected, except a sum of \$3,248.80 paid to Inspector Constantine in 1894, by the North American Transportation and Trading Company and others, and it is safe to conclude, especially when it is remembered that

the country produces none of the articles consumed within it except fresh meat, that a large revenue was being lost to the public exchequer under the then existing conditions.

"For the purpose of ascertaining officially and authoritatively the condition of affairs to which the correspondence referred to in the next preceding paragraph relates, the Honourable the President of the Privy Council, during the spring of 1894, despatched Inspector Charles Constantine, of the North-west Mounted Police Force, accompanied by Sergeant Brown, to Fort Cudahy and the mining camps in its vicinity. The report made by Mr. Constantine on his return established the substantial accuracy of the representations already referred to. The value of the total output of gold for the season of 1894 he estimated at \$300,000, a very large sum considering the relatively short period to which mining operations are, by the nature of the climate, confined.

"The facts recited clearly establish—first, that the time had arrived when it became the duty of the Government of Canada to make more efficient provision for the maintenance of order, the enforcement of the laws, and the administration of justice in the Yukon country, especially in that section of it in which placer mining for gold is being prosecuted upon such an extensive scale, situated near to the boundary separating the North-west Territories from the possessions of the United States in Alaska; and, second, that while such measures as were necessary to that end were called for in the interests of humanity, and particularly for the security and safety of the lives and property of the Canadian subjects of Her Majesty resident in that country who are engaged in legitimate business pursuits, it was evident that the revenue justly due to the Government of Canada, under its customs, excise and land laws, and which would go a long way to pay the expenses of government, was being lost for the want of adequate machinery for its collection.

"Accordingly in June last a detachment\* of twenty members of the Mounted Police Force including officers was detailed for service in that portion of the North-west Territories. The officer in command, in addition to the magisterial and other duties he is required to perform by virtue of his office and under instructions from the Department of Mounted Police, was duly authorized to represent where necessary, and until other arrangements can be made, all the departments of the government having interests in that region. Particularly he is authorized to perform the duties of Dominion lands agent, collector of customs, and collector of inland revenue. At the same time instructions were given Mr. William Ogilvie, the surveyor referred to as having, with Dr. Dawson, been entrusted with the conduct of the first government expedition to the Yukon, to proceed again to that district for the purpose of continuing and extending the work of determining the 141st meridian, of laying out building lots and mining claims, and generally of performing such duties as may be entrusted to him from time to time. Mr. Ogilvie's qualifications as a surveyor, and his previous experience as explorer of this section of the North-west, peculiarly fit him for the task.

"As it appears quite certain, from the report made by Mr. Ogilvie on his return to Ottawa in 1889, and from the report of Mr. Constantine, that the operations of the miners are being conducted upon streams which have their sources in the United States Territory of Alaska, and flow into Canada on their way to join the Yukon, and as doubtless some of the placer diggings under development are situated on the United States side of the boundary, it is highly desirable, both for the purpose of settling definitely to which country any land occupied for mining or other purposes actually belongs, and in order that the jurisdiction of the courts and officers of the United States and Canada, for both civil and criminal purposes, may be established, that the determination of the 141st meridian west of Greenwich from the point of its intersection with the Yukon, as marked by Mr. Ogilvie in 1887-88, for a considerable distance south of the river, and possibly also for some distance to the north, should be proceeded with at

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\*The detachment was made up as follows:—Inspector C. Constantine, Officer Commanding Yukon Detachment N. W. M. Police; Inspector, D. A. E. Strickland; Assistant Surgeon, A. E. Wills; 2 Staff Sergeants; 2 Corporals; 13 Constables.

once. Mr. Ogilvie's instructions require him to go on with the survey with all convenient speed, but in order that this work may be effective for the accomplishment of the object in view the co-operation of the Government of the United States is necessary. Correspondence is in progress through the proper authorities with a view to obtaining this co-operation. It may be mentioned that a United States surveyor has also determined the points at which the Yukon River and Forty Mile Creek are intersected by the 141st meridian."

Since the date of the above report, Mr. D. W. Davis has been appointed collector of customs for the Yukon district.

The business of the Department of the Interior having grown to such proportions that Inspector Constantine was no longer able to deal with it and discharge the numerous other duties assigned to him, Mr. Thos. Fawcett, Dominion Topographical Surveyor, has been appointed gold commissioner, surveyor and general agent of the Minister of the Interior for the district. Accompanying him and acting under his instructions are two Dominion land surveyors, Jas. Gibbons and E. D. Bolton, with their parties.

### MEANS OF ACCESS.

The great obstacle to the development of the district is the difficulty of access.

There are at present only two travelled routes. One is by Lynn Canal, the Taiya Pass and down the Yukon ; the other is by way of St. Michael, Alaska, ascending the river from its mouth.

The Alaska Commercial Company and the North American Transportation and Trading Company have steamers plying between San Francisco, Seattle and St. Michael. At the last named place the passengers and freight are transferred to stern wheel river boats, and Cudahy is reached after ascending the swift current of the Yukon for 1,600 miles.

The Alaska Commercial Company's steamer "Excelsior" is advertised to leave San Francisco for St. Michael on or about June 5th, August 5th and September 5th, connecting with the river steamers "Alice," "Bella" and "Arctic" for all points on the Yukon River.

The North American Transportation and Trading Company's steamers leave San Francisco on June 1st and August 1st ; Seattle on June 10th and August 10th. Fare is \$150 from Seattle.

Nearly the whole of the supplies for the district come by steamer up the river ; it is the easiest but the longest route, and the diggings are not reached till a considerable portion of the short summer season has passed. As a rule it is not safe to enter Norton Sound on account of ice before the 1st of July. St. Michael is 80 miles from the northerly mouth of the Yukon ; to cover that distance in a flat bottomed river boat requires calm weather. After crossing the bar the boat is tied up for cleaning the boilers and getting rid of the salt. The passage up the river takes from 18 to 20 days, and the round trip about a month. The first boat does not arrive till late in July, and the river closes in September, so that the arrival of the last boats is somewhat uncertain ; last year they are said to have been frozen in at Circle City. Two round trips in the season are all that can be relied upon.

Many parties prefer going by Lynn Canal, the Taiya Pass and down the Yukon. The distance from the sea to Cudahy is only 630 miles, and by starting in April or May the diggings are reached in the beginning of June.

The upper part of the river opens several weeks before the lower part is free from ice. After crossing the pass, the trip to Cudahy can be accomplished in eight days ; it is fully described later on.

Another route is now being explored between Telegraph Creek and Teslin Lake and will soon be opened. Telegraph Creek is the head of steamer navigation on the Stikine River and is about 150 miles from Teslin Lake. The Yukon is navigable for steamers from its mouth to Teslin Lake, a distance of 2,300 miles. A road is being located by the Dominion Government. A grant of \$2,000 has been made by the province of British Columbia for opening it.

J. Dalton, a trader, has used a route overland from Chilkat Inlet to Fort Selkirk. Going up the Chilkat and Kilaheela Rivers, he crosses the divide to the Tahkeena River and continues northward over a fairly open country practicable for horses. The distance from the sea to Fort Selkirk is 350 miles.

Last summer a Juneau butcher sent 40 head of cattle to Cudahy. G. Bounds, the man in charge, crossed the divide over the Chilkat Pass, followed the shore of Lake Arkell and, keeping to the east of Dalton's trail, reached the Yukon just below the Rink Rapids. Here the cattle were slaughtered and the meat floated down on a raft to Cudahy, where it retailed at \$1 a pound.

It is proposed to establish a winter road somewhere across the country travelled over by Dalton and Bounds. The Yukon cannot be followed, the ice being too much broken, so that any winter road will have to be overland. A thorough exploration is now being made of all the passes at the head of Lynn Canal and of the upper waters of the Yukon. In a few months it is expected that the best routes for reaching the district from Lynn Canal will be definitely known.

#### MR. OGILVIE'S EXPLORATION OF 1887.

Mr W. Ogilvie describes as follows his trip down the Yukon River in 1887.

The first news I received on landing at Chilkoot was that there was trouble in the interior, on the Lewes River, in the vicinity where I intended to go. A miner, who had recently arrived from the interior, stated that there had been a fight between the Indians and the miners at the mouth of Stewart River. The result of the affair, he alleged, was that four Indians and two white men had been killed, and that the Indians had come up the river as far as the cañon to lie in wait for any white men who might be going into the country. I did not have an opportunity of questioning him, as he had gone to Juneau the day before I arrived. The rumour seemed to me to be somewhat improbable; but true or false, it was an unpleasant one to hear, and the only way to verify it was to go and see whether the Indians were hostile or not. Happily the whole story proved to be untrue. I subsequently learned from the miners in the interior that he had had difficulties with them, in consequence of which he was ordered in mid-winter to leave the region, which the miners consider equivalent to a sentence of death. Strange to say, he succeeded in getting out alive, making a distance of upwards of 500 miles of the most dangerous and difficult travelling. He started in the month of February, I think, and reached the coast in the month of May. It is reported that on his way out he had more trouble with an Indian whom he hired to accompany him. Another miner named Williams started from Stewart River for the coast in the month of December, carrying a message from Harper, McQuestion & Co., and mail from the miners. This man had the advantage at intervals of the assistance of the miners, a few of whom were scattered along the river in the vicinity of the Teslinto (the Newberry of Schwatka). At the summit of the coast range he was detained by a snow storm for three days, and the hardships he suffered brought on pneumonia, from the effects of which he died.

It is said by those familiar with the locality that the storms which rage in the upper altitudes of the coast range during the greater part of the time, from October to March, are terrific. A man caught in one of them runs the risk of losing his life, unless he can reach shelter in a short time. During the summer there is nearly always a wind



blowing from the sea up Chatham Strait and Lynn Canal, which lie in almost a straight line with each other, and at the head of Lynn Canal are Chilkat and Chilkoot Inlets. The distance from the coast down these channels to the open sea is about 380 miles. The mountains on each side of the water confine the currents of air, and deflect inclined currents in the direction of the axis of the channel, so that there is nearly always a strong wind blowing up the channel. Coming from the sea, this wind is heavily charged with moisture, which is precipitated when the air current strikes the mountains, and the fall of rain and snow is consequently very heavy.

In Chilkat Inlet there is not much shelter from the south wind, which renders it unsafe for ships calling there. Capt. Hunter told me he would rather visit any other part of the coast than Chilkat.

After landing at Chilkoot the weather continued very wet for three days, so that I could not do anything in the way of commencing the survey, and during the delay myself and party were employed in making preparations for carrying the instruments, provisions and other baggage up to the head of Taiya Inlet, a distance of 20½ miles. This was accomplished by securing the services of two boats belonging to a trader, which were towed to the head of the Taiya Inlet by the United States gunboat "Pinta," to the commander of which (Capt. Newell) I owe a debt of gratitude for his very obliging and attentive treatment of myself and party.

#### FROM TAIYA INLET TO THE ALASKA BOUNDARY.

On the 30th of May I commenced the survey by connecting Pyramid Island in Chilkat Inlet with Chilkoot Inlet at Haines mission. At this point a Protestant mission was established some years ago; but it is now abandoned, owing, as I was informed, to the very unpleasant conduct of the Chilkoot Indians. I could not learn that they had committed any overt act of hostility, but it appears the missionary tried to relieve the sufferings of a sick Indian child. Unfortunately, the child died, and the father attributed the death to the missionary, and from that time acted in so suspicious a manner towards the children of the latter that he considered it unsafe to remain in the vicinity, and moved into Juneau.

The teacher of the United States Government school for Indians at Haines mission, Col. Ripinsky, told me he had got into trouble in the same way. A sick Indian to whom he administered medicine at first became much worse, in consequence, apparently, of the treatment, and during this time the patient's relatives walked about in an exciting manner, manifesting very unpleasant signs of hostility. Fortunately the man finally recovered, but Col. Ripinsky has no doubt that his life would not have been safe had he died.

The latitude and longitude of Pyramid Island were determined in 1869 by a United States Coast Survey party, who were sent out to observe the eclipse of the sun in the month of August of that year. The position then determined is given in the "Alaska Coast Pilot" as latitude 59° 11' 43" .0, longitude 135° 27' 04" .5. The longitude was determined by chronometers, thirteen having been used by the expedition. What point of the island was fixed I could not ascertain, so I took the centre. This island is pyramidal in form, as seen from the south-west or north-east, and about 500 yards long by 200 wide. It is composed of sand and clay, and rises about 80 feet above high tide, being evidently the result of glacial action. At low tide there is very little water on the north side of the island, and it is only a question of a few years until it will cease to be an island altogether, owing to the constant accumulation of drift brought down by the streams flowing into the inlet.

To carry the survey from the island across to Chilkoot Inlet I had to get up on the mountains north of Haines mission, and from there could see both inlets. Owing to the

bad weather I could get no observation for azimuth, and had to produce the survey from Pyramid Island to Taiya Inlet by reading the angles of deflection between the courses. At Taiya Inlet I got my first observation, and deduced the azimuths of my courses up to that point. Taiya Inlet has evidently been the valley of a glacier; its sides are steep and smooth from glacial action; and this, with the wind almost constantly blowing landward, renders getting upon the shore difficult. Some long sights were therefore necessary. The survey was made up to the head of the inlet on the 2nd of June. Preparations were then commenced for taking the supplies and instruments over the coast range of mountains to the head of Lake Lindeman on the Lewes River. Commander Newell kindly aided me in making arrangements with the Indians, and did all he could to induce them to be reasonable in their demands. This, however, neither he nor any one else could accomplish. They refused to carry to the lake for less than \$20 per hundred pounds, and as they had learned that the expedition was an English one, the second chief of the Chilkoot Indians recalled some memories of an old quarrel which the tribe had with the English many years ago, in which an uncle of his was killed, and he thought we should pay for the loss of his uncle by being charged an exorbitant price for our packing, of which he had the sole control. Commander Newell told him I had a permit from the Great Father at Washington to pass through his country safely, that he would see that I did so, and if the Indians interfered with me they would be punished for doing so. After much talk they consented to carry our stuff to the summit of the mountain for \$10 per hundred pounds. This is about two-thirds of the whole distance, includes all the climbing and all the woods, and is by far the most difficult part of the way.

On the 6th of June 120 Indians, men, women and children, started for the summit. I sent two of my party with them to see the goods delivered at the place agreed upon. Each carrier when given a pack also got a ticket, on which was inscribed the contents of the pack, its weight, and the amount the individual was to get for carrying it. They were made to understand that they had to produce these tickets on delivering their packs, but were not told for what reason. As each pack was delivered one of my men receipted the ticket and returned it. The Indians did not seem to understand the import of this; a few of them pretended to have lost their tickets; and as they could not get paid without them, my assistant, who had duplicates of every ticket, furnished them with receipted copies, after examining their packs.

While they were packing to the summit I was producing the survey, and I met them on their return at the foot of the cañon, about eight miles from the coast, where I paid them. They came to the camp in the early morning before I was up, and for about two hours there was quite a hubbub. When paying them I tried to get their names, but very few of them would give any Indian name, nearly all, after a little reflection, giving some common English name. My list contained little else than Jack, Tom, Joe, Charley, &c., some of which were duplicated three and four times. I then found why some of them had pretended to lose their tickets at the summit. Three or four who had thus acted presented themselves twice for payment, producing first the receipted ticket, afterwards the one they claimed to have lost, demanding pay for both. They were much taken aback when they found that their duplicity had been discovered.

These Indians are perfectly heartless. They will not render even the smallest aid to each other without payment; and if not to each other, much less to a white man. I got one of them, whom I had previously assisted with his pack, to take me and two of my party over a small creek in his canoe. After putting us across he asked for money, and I gave him half a dollar. Another man stepped up and demanded pay, stating that the canoe was his. To see what the result would be, I gave to him the same amount as to the first. Immediately there were three or four more claimants for the canoe. I dismissed them with a blessing, and made up my mind that I would wade the next creek.

While paying them I was a little apprehensive of trouble, for they insisted on

crowding into my tent, and for myself and the four men who were with me to have attempted to eject them would have been to invite trouble. I am strongly of the opinion that these Indians would have been much more difficult to deal with if they had not known that Commander Newell remained in the inlet to see that I got through without accident.

While making the survey from the head of tide water I took the azimuths and altitudes of several of the highest peaks around the head of the inlet, in order to locate them, and obtain an idea of the general height of the peaks in the coast range. As it does not appear to have been done before, I have taken the opportunity of naming all the peaks, the positions of which I fixed in the above way. The names and altitudes appear on my map.

While going up from the head of canoe navigation on the Taiya River I took the angles of elevation of each station from the preceding one. I would have done this from tide water up, but found many of the courses so short and with so little increase in height that with the instrument I had it was inappreciable. From these angles I have computed the height of the summit of the Taiya Pass,\* above the head of canoe navigation, as it appeared to me in June, 1887, and find it to be 3,378 feet. What depth of snow there was I cannot say. The head of canoe navigation I estimate at about 120 feet above tide water. Dr. Dawson gives it as 124 feet.

I determined the descent from the summit to Lake Lindeman by carrying the aneroid from the lake to the summit and back again, the interval of time from start to return being about eight hours. Taking the mean of the readings at the lake, start and return, and the single reading at the summit, the height of the summit above the lake was found to be 1,237 feet. While making the survey from the summit down to the lake I took the angles of depression of each station from the preceding one, and from these angles I deduced the difference of height, which I found to be 1,354 feet, or 117 feet more than that found by the aneroid. This is quite a large difference; but when we consider the altitude of the place, the sudden changes of temperature, and the atmospheric conditions, it is not more than one might expect.

While at Juneau I heard reports of a low pass from the head of Chilkoot Inlet to the head waters of Lewes River. During the time I was at the head of Taiya Inlet I made inquiries regarding it, and found that there was such a pass, but could learn nothing definite about it from either whites or Indians. As Capt. Moore, who accompanied me, was very anxious to go through it, and as the reports of the Taiya Pass indicated that no wagon road or railroad could ever be built through it, while the new pass appeared, from what little knowledge I could get of it, to be much lower and possibly feasible for a wagon road, I determined to send the captain by that way, if I could get an Indian to accompany him. This, I found, would be difficult to do. None of the Chilkoots appeared to know anything of the pass, and I concluded that they wished to keep its existence and condition a secret. The Tagish, or Stick Indians, as the interior Indians are locally called, are afraid to do anything in opposition to the wishes of the Chilkoots; so it was difficult to get any of them to join Capt. Moore; but after much talk and encouragement from the whites around, one of them named "Jim" was induced to go. He had been through this pass before, and proved reliable and useful. The information obtained from Capt. Moore's exploration I have incorporated in my plan of the survey from Taiya Inlet, but it is not as complete as I would have liked. I have named this pass "White Pass," in honour of the late Hon. Thos. White, Minister of the Interior, under whose authority the expedition was

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\*The distance from the head of Taiya Inlet to the summit of the pass is 15 miles, and the whole length of the pass to Lake Lindeman is 23 miles. Messrs. Healy and Wilson, dealers in general merchandise and miners' supplies at Taiya, have a train of pack horses carrying freight from the head of Lynn Canal to the summit. They hope to be able to take freight through to Lake Lindeman with their horses during the present season.

organized. Commencing at Taiya Inlet, about two miles south of its north end, it follows up the valley of the Shkagway River to its source, and thence down the valley of another river which Capt. Moore reported to empty into the Takone or Windy Arm of Bove Lake (Schwatka). Dr. Dawson says this stream empties into Taku Arm, and in that event Capt. Moore is mistaken. Capt. Moore did not go all the way through to the lake, but assumed from reports he heard from the miners and others that the stream flowed into Windy Arm, and this also was the idea of the Indian "Jim" from what I could gather from his remarks in broken English and Chinook. Capt. Moore estimates the distance from tide water to the summit at about 18 miles, and from the summit to the lake at about 22 to 23 miles. He reports the pass as thickly timbered all the way through.

The timber line on the south side of the Taiya Pass, as determined by barometer reading, is about 2,300 feet above the sea, while on the north side it is about 1,000 feet below the summit. This large difference is due, I think, to the different conditions in the two places. On the south side the valley is narrow and deep, and the sun cannot produce its full effect. The snow also is much deeper there, owing to the quantity which drifts in from the surrounding mountains. On the north side the surface is sloping, and more exposed to the sun's rays. On the south side the timber is of the class peculiar to the coast, and on the north that peculiar to the interior. The latter would grow at a greater altitude than the coast timber. It is possible that the summit of White Pass is not higher than the timber line on the north of the Taiya Pass, or about 2,500 feet above tide water, and it is possibly even lower than this, as the timber in a valley such as the White Pass would hardly live at the same altitude as on the open slope on the north side.

Capt. Moore has had considerable experience in building roads in mountainous countries. He considers that this would be an easy route for a wagon road compared with some roads he has seen in British Columbia. Assuming his distances to be correct, and the height of the pass to be probably about correctly indicated, the grades would not be very steep, and a railroad could easily be carried through if necessary.

After completing the survey down to the lake, I set about getting my baggage down too. Of all the Indians who came to the summit with packs, only four or five could be induced to remain and pack down to the lake, although I was paying them at the rate of \$4 per hundred pounds. After one trip down only two men remained, and they only in hopes of stealing something. One of them appropriated a pair of boots, and was much surprised to find that he had to pay for them on being settled with. I could not blame them much for not caring to work, as the weather was very disagreeable—it rained or snowed almost continuously. After the Indians left I tried to get down the stuff with the aid of my own men, but it was slavish and unhealthy labour, and after the first trip one of them was laid up with what appeared to be inflammatory rheumatism. The first time the party crossed, the sun was shining brightly, and this brought on snow blindness, the pain of which only those who have suffered from this complaint can realize. I had two sleds with me which were made in Juneau specially for the work of getting over the mountains and down the lakes on the ice. With these I succeeded in bringing about a ton and a-half to the lakes, but I found that the time it would take to get all down in this way would seriously interfere with the programme arranged with Dr. Dawson, to say nothing of the suffering of the men and myself, and the liability to sickness which protracted physical exertion under such uncomfortable conditions and continued suffering from snow blindness expose us to. I had with me a white man who lived at the head of the inlet with a Tagish Indian woman. This man had a good deal of influence with the Tagish tribe, of whom the greater number were then in the neighbourhood where he resided, trying to get some odd jobs of work, and I sent him to the head of the inlet to try and induce the Tagish Indians to undertake the transportation, offering them \$5 per hundred pounds. In the meantime Capt. Moore and the Indian "Jim" had rejoined me. I had their assistance

for a day or two, and "Jim's" presence aided indirectly in inducing the Indians to come to my relief.

The Tagish are little more than slaves to the more powerful coast tribes, and are in constant dread of offending them in any way. One of the privileges which the coast tribes claim is the exclusive right to all work on the coast or in its vicinity, and the Tagish are afraid to dispute this claim. When my white man asked the Tagish to come over and pack they objected on the grounds mentioned. After considerable ridicule of their cowardice, and explanation of the fact that they had the exclusive right to all work in their own country, the country on the north side of the coast range being admitted by the coast Indians to belong to the Tagish tribe just as the coast tribes had the privilege of doing all the work on the coast side of the mountains, and that one of their number was already working with me unmolested, and likely to continue so, nine of them came over, and in fear and trembling began to pack down to the lake. After they were at work for a few days some of the Chilkoots came out and also started to work. Soon I had quite a number at work and was getting my stuff down quite fast. But this good fortune was not to continue. Owing to the prevailing wet, cold weather on the mountains, and the difficulty of getting through the soft wet snow, the Indians soon began to quit work for a day or two at a time, and to gamble with one another for the wages already earned. Many of them wanted to be paid in full, but this I positively refused, knowing that to do so was to have them all apply for their earnings and leave me until necessity compelled them to go to work again. I once for all made them distinctly understand that I would not pay any of them until the whole of the stuff was down. As many of them had already earned from twelve to fifteen dollars each, to lose which was a serious matter to them, they reluctantly resumed work and kept at it until all was delivered. This done, I paid them off, and set about getting my outfit across the lake, which I did with my own party and the two Peterborough canoes which I had with me.

These two canoes travelled about 3,000 miles by rail and about 1,000 miles by steamship before being brought into service. They did considerable work on Chilkoot and Taiya Inlets, and were then packed over to the head of Lewes River (Lake Lindeman), from where they were used in making the survey of Lewes and Yukon Rivers. In this work they made about 650 landings. They were then transported on sleighs from the boundary on the Yukon to navigable water on the Porcupine.

In the spring of 1888 they descended the latter river, heavily loaded, and through much rough water, to the mouth of Bell's River, and up it to McDougall's Pass. They were then carried over the pass to Poplar River and were used in going down the latter to Peel River, and thence up Mackenzie River 1,400 miles; or, exclusive of railway and ship carriage, they were carried about 170 miles and did about 2,500 miles of work for the expedition, making in all about 1,700 landings in no easy manner and going through some very bad water. I left them at Fort Chipewyan in fairly good condition, and, with a little painting, they would go through the same ordeal again.

After getting all my outfit over to the foot of Lake Lindeman I set some of the party to pack it to the head of Lake Bennet. The stream between these two lakes is too shallow and rough to permit of canoe navigation, and everything had to be portaged the greater part of the way.

I employed the rest of the party in looking for timber to build a boat to carry my outfit of provisions and implements down the river to the vicinity of the international boundary, a distance of about 700 miles. It took several days to find a tree large enough to make plank for the boat I wanted, as the timber around the upper end of the lake is small and scrubby. My boat was finished on the evening of the 11th of July, and on the 12th I started a portion of the party to load it and go ahead with it and the outfit to the cañon. They had instructions to examine the cañon and, if necessary, to carry a part of the outfit past it—in any case, enough to support the party back to

the coast should accident necessitate such procedure. With the rest of the party I started to carry on the survey, which may now be said to have fairly started ahead on the lakes. This proved tedious work, on account of the stormy weather.

In the summer months there is nearly always a wind blowing in from the coast; it blows down the lakes and produces quite a heavy swell. This would not prevent the canoes going with the decks on, but, as we had to land every mile or so, the rollers breaking on the generally flat beach proved very troublesome. On this account I found I could not average more than ten miles per day on the lakes, little more than half of what could be done on the river.

The survey was completed to the cañon on the 20th of July. There I found the party with the large boat had arrived on the 18th, having carried a part of the supplies past the cañon, and were awaiting my arrival to run through it with the rest in the boat. Before doing so, however, I made an examination of the cañon. The rapids below it, particularly the last rapid of the series (called the White Horse by the miners), I found would not be safe to run. I sent two men through the cañon in one of the canoes to await the arrival of the boat, and to be ready in case of an accident to pick us up. Every man in the party was supplied with a life-preserver, so that should a casualty occur we would all have floated. Those in the canoe got through all right; but they would not have liked to repeat the trip. They said the canoe jumped about a great deal more than they thought it would, and I had the same experience when going through in the boat.

The passage through is made in about three minutes, or at the rate of about  $12\frac{1}{2}$  miles an hour. If the boat is kept clear of the sides there is not much danger in high water; but in low water there is a rock in the middle of the channel, near the upper end of the cañon, that renders the passage more difficult. I did not see this rock myself, but got my information from some miners I met in the interior, who described it as being about 150 yards down from the head and a little to the west of the middle of the channel. In low water it barely projects above the surface. When I passed through there was no indication of it, either from the bank above or from the boat.

The distance from the head to the foot of the cañon is five-eighths of a mile. There is a basin about midway in it about 150 yards in diameter. This basin is circular in form, with steep sloping sides about 100 feet high. The lower part of the cañon is much rougher to run through than the upper part, the fall being apparently much greater. The sides are generally perpendicular, about 80 to 100 feet high, and consist of basalt, in some places showing hexagonal columns.

The White Horse Rapids are about three-eighths of a mile long. They are the most dangerous rapids on the river, and are never run through in boats except by accident. They are confined by low basaltic banks, which, at the foot, suddenly close in and make the channel about 30 yards wide. It is here the danger lies, as there is a sudden drop and the water rushes through at a tremendous rate, leaping and seething like a cataract. The miners have constructed a portage road on the west side, and put down rollways in some places on which to shove their boats over. They have also made some windlasses with which to haul their boats up hill, notably one at the foot of the cañon. This roadway and the windlasses must have cost them many hours of hard labour. Should it ever be necessary, a tramway could be built past the cañon on the east side with no great difficulty. With the exception of the Five Finger Rapids these appear to be the only serious rapids on the whole length of the river.

Five Finger Rapids are formed by several islands standing in the channel and backing up the water so much as to raise it about a foot, causing a swell below for a few yards. The islands are composed of conglomerate rock, similar to the cliffs on each side of the river, whence one would infer that there has been a fall here in past ages. For about two miles below the rapids there is a pretty swift current, but not enough to prevent the ascent of a steamboat of moderate power, and the rapids themselves I do



not think would present any serious obstacle to the ascent of a good boat. In very high water warping might be required. Six miles below these rapids are what are known as "Rink Rapids." This is simply a barrier of rocks, which extends from the westerly side of the river about half way across. Over this barrier there is a ripple which would offer no great obstacle to the descent of a good canoe. On the easterly side there is no ripple, and the current is smooth and the water apparently deep. I tried with a 6 foot paddle, but could not reach the bottom.

On the 11th of August I met a party of miners coming out who had passed Stewart River a few days before. They saw no sign of Dr. Dawson having been there. This was welcome news for me, as I expected he would have reached that point long before I arrived, on account of the many delays I had met with on the coast range. These miners also gave me the pleasant news that the story told at the coast about the fight with the Indians at Stewart River was false, and stated substantially what I have already repeated concerning it. The same evening I met more miners on their way out, and the next day met three boats, each containing four men. In the crew of one of them was a son of Capt. Moore, from whom the captain got such information as induced him to turn back and accompany them out.

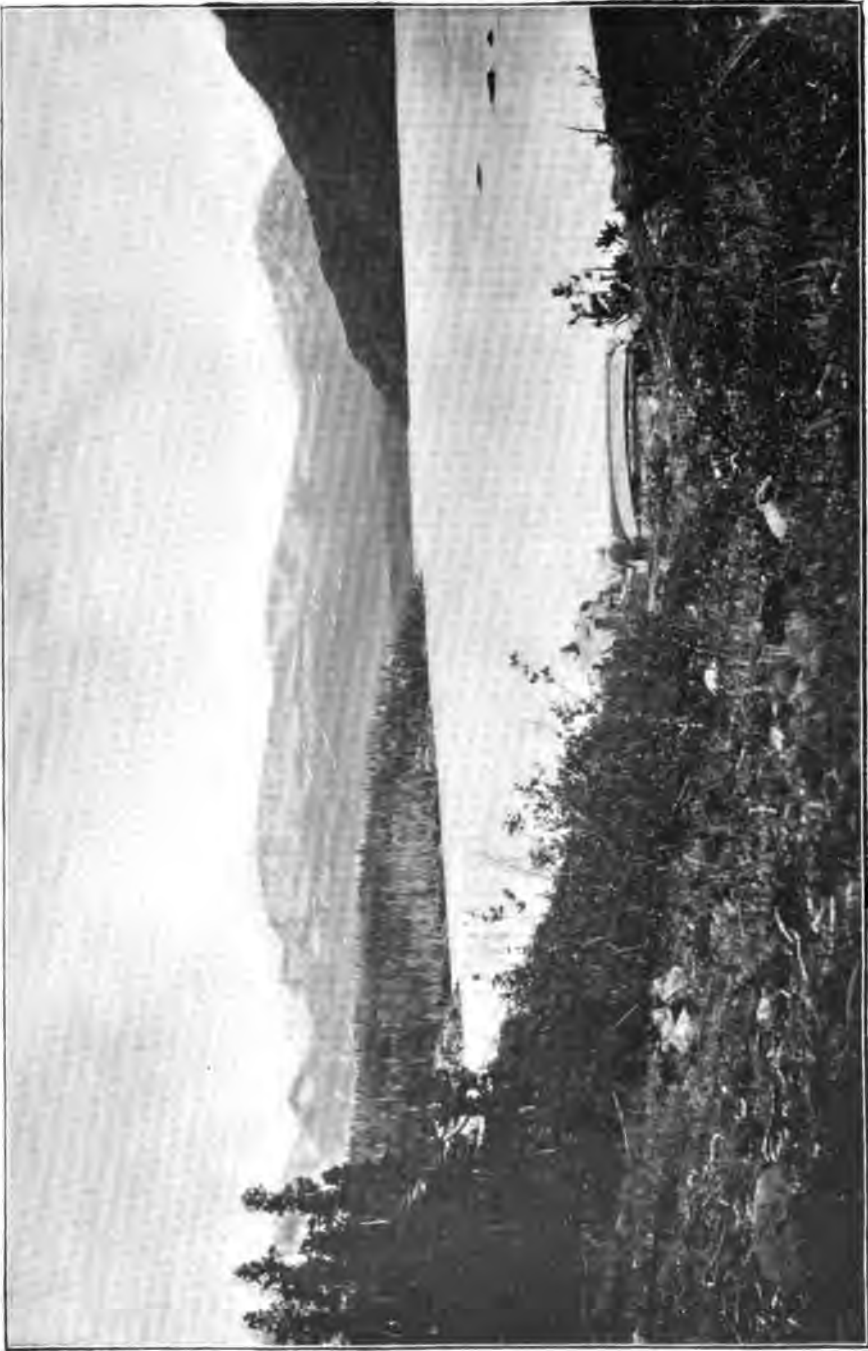
Next day, the 13th, I got to the mouth of the Pelly, and found that Dr. Dawson had arrived there on the 11th. The doctor also had experienced many delays, and had heard the same story of the Indian uprising in the interior. I was pleased to find that he was in no immediate want of provisions, the fear of which had caused me a great deal of uneasiness on the way down the river, as it was arranged between us in Victoria that I was to take with me provisions for his party to do them until their return to the coast. The doctor was so much behind the time arranged to meet me that he determined to start for the coast at once. I therefore set about making a short report and plan of my survey to this point; and, as I was not likely to get another opportunity of writing at such length for a year, I applied myself to a correspondence designed to satisfy my friends and acquaintances for the ensuing twelve months. This necessitated three days' hard work.

On the morning of the 17th the doctor left for the outside world, leaving me with a feeling of loneliness that only those who have experienced it can realize. I remained at the mouth of the Pelly during the next day taking magnetic and astronomical observations, and making some measurements of the river. On the 19th I resumed the survey and reached White River on the 25th. Here I spent most of a day trying to ascend this river, but found it impracticable, on account of the swift current and shallow and very muddy water. The water is so muddy that it is impossible to see through one-eighth of an inch of it. The current is very strong, probably eight miles or more per hour, and the numerous bars in the bed are constantly changing place. After trying for several hours, the base men succeeded in doing about half a mile only, and I came to the conclusion that it was useless to try to get up this stream to the boundary with canoes. Had it proved feasible I had intended making a survey of this stream to the boundary, to discover more especially the facilities it offered for the transport of supplies in the event of a survey of the International Boundary being undertaken.

I reached Stewart River on the 26th. Here I remained a day taking magnetic observations, and getting information from a miner, named McDonald, about the country up that river. McDonald had spent the summer up the river prospecting and exploring. His information will be given in detail further on.

Fort Reliance was reached on the 1st of September, and Forty Mile River (Cone-Hill River of Schwatka) on the 7th. In the interval between Fort Reliance and Forty Mile River there were several days lost by rain.

At Forty Mile River I made some arrangements with the traders there (Messrs. Harper & McQuestion) about supplies during the winter, and about getting Indians to assist me in crossing from the Yukon to the head of the Porcupine, or perhaps on to the Peel River. I then made a survey of the Forty Mile River up to the cañon. I



Lake Lindeman looking towards Taiya Pass.





Miles Cañon.





White Horse Rapids.





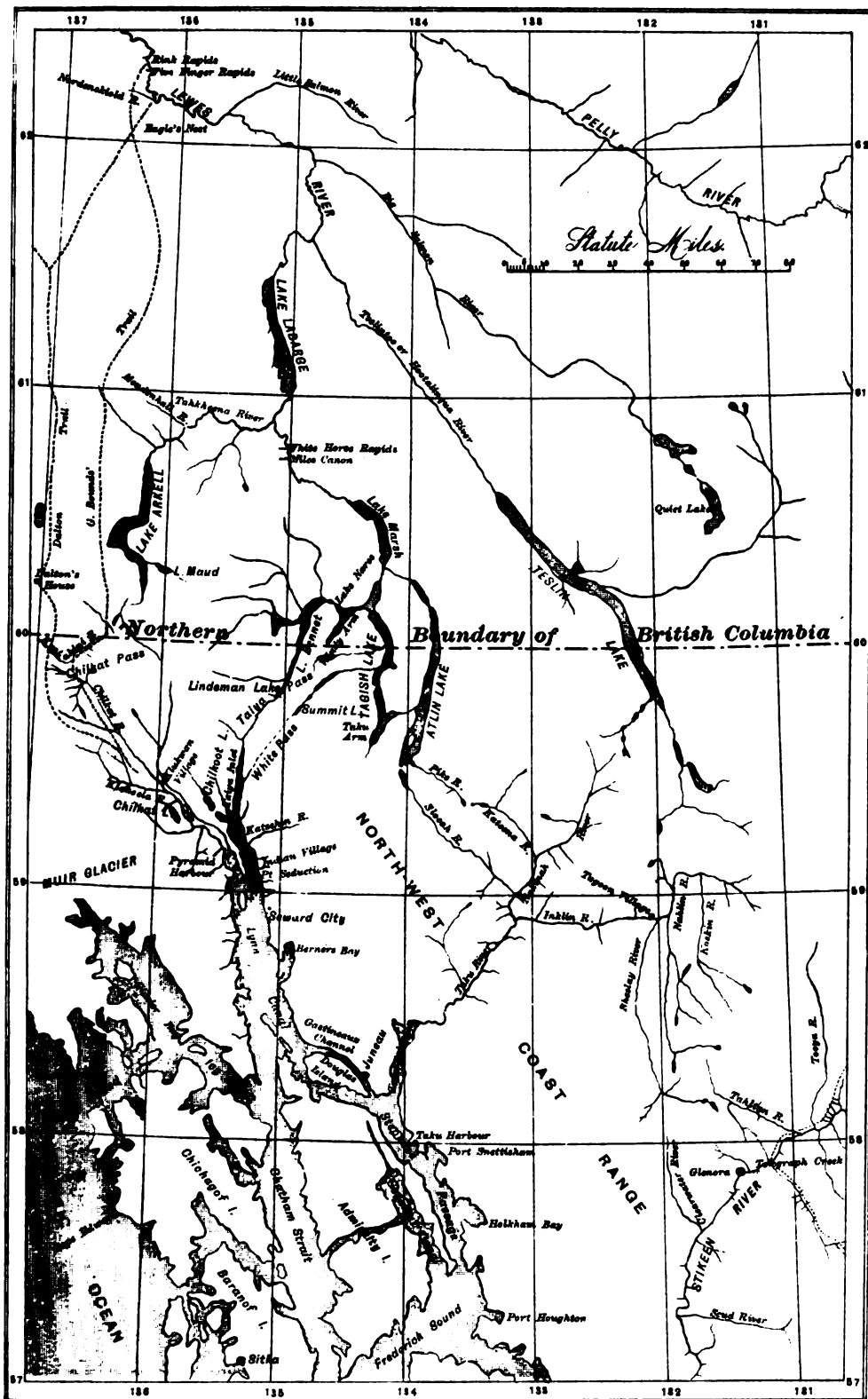
Looking down the Cañon on Forty Mile River.











JUNE 14<sup>TH</sup> 1897

PHOTO-LITHOGRAPHED AT THE LITHOGRAPHIC OFFICE OF THE DEPARTMENT OF THE INTERIOR.



found the cañon would be difficult of ascent, and dangerous to descend, and therefore, concluded to defer further operations until the winter, and until after I had determined the longitude of my winter post near the boundary, when I would be in a much better position to locate the intersection of the International Boundary with this river, a point important to determine on account of the number and richness of the mining claims on the river.

I left Forty Mile River for the boundary line between Alaska and the North-west Territories on the 12th September, and finished the survey to that point on the 14th. I then spent two days in examining the valley of the river in the vicinity of the boundary to get the most extensive view of the horizon possible, and to find a tree large enough to serve for a transit stand.

Before leaving Toronto I got Mr. Foster to make large brass plates with V's on them, which could be screwed firmly to a stump, and thus be made to serve as a transit stand. I required a stump at least 22 inches in diameter to make a base large enough for the plates when properly placed for the transit. In a search which covered about four miles of the river bank, on both sides, I found only one tree as large as 18 inches. I mention this fact to give an idea of the size of the trees along the river in this vicinity. I had this stump enlarged by firmly fixing pieces on the sides so as to bring it up to the requisite size. This done, I built around the stump a small transit house of the ordinary form and then mounted and adjusted my transit. Meanwhile, most of the party were busy preparing our winter quarters and building a magnetic observatory. As I had been led to expect extremely low temperatures during the winter, I adopted precautionary measures, so as to be as comfortable as circumstances would permit during our stay there.

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#### SURVEY OF FORTY MILE RIVER, FROM ITS MOUTH TO THE INTERNATIONAL BOUNDARY LINE.

\* \* \* \* \*

On the 9th of February I started with the survey from where I had left it in the summer, as already mentioned.

During the progress of this work the weather was cold, and as the days were only four or five hours long the progress was necessarily slow, so that I did not complete the survey to the boundary until the 12th. The distance from the mouth of the Forty Mile River up it to the boundary is, by the river, twenty-three miles. I marked the intersection of the river by the boundary by blazing trees on both sides and marked on some of the trees the letters "A" and "C" on the west and east sides, respectively, for Alaska and Canada.

The natural features of the ground here afford also a good mark. On the north side of the river two small creeks fall into Forty Mile River, almost together, and between them there is a sharp rocky mound about 150 feet high. This mound stands where the boundary crosses the river, and from this point one can see northwards up the valleys of the creek for several miles. This is the first place on the river where such a distant view can be had.

I returned to the post at the mouth of the river, and spent two days with the traders Harper and McQuestion and the miners who were camped around.

Harper, McQuestion & Co., moved from Stewart River down to this point in the spring of 1887, so as to be where most of the miners were located. On Forty Mile River, in the season of 1886, coarse gold was found, the first discovery on the Yukon or any of its tributaries. Coarse gold is the desideratum of all gold miners, and as soon as the news of the discovery spread to the other mining camps, where nothing but fine or dust gold had yet been found, they all repaired to the coarse gold diggings on Forty Mile.

About one hundred miners wintered in the country, most of whom camped at Forty Mile. A few wintered down at the old trading post built by F. Mercier, and named by him Belle Isle. This post is where Lieut. Schwatka located the International Boundary, but it is about twelve miles below the boundary by my survey and observations.

When I was at Forty Mile River the miners were very anxious to see me, and to know our mining regulations and laws. I explained everything they inquired about as fully as my knowledge and the documents at my disposal would permit. Many of them who were used to the United States system of each mining community making its own by-laws, based on the general mining law of the country, and electing their own recorder to attend to the regulations and see them carried out, thought some of our regulations rather stringent and hard. I heard their statements and answered such of them as I could, and also promised to lay their views before the department. This I have already done in a report sent by me in the spring of 1888. As this report is of purely administrative import, it is not necessary to quote it here.

During the winter there were many cases of sickness at Forty Mile, most of them scurvy. There were three deaths, only one of which was due to scurvy.

I returned to my quarters on the 17th February, and immediately set the party at work drawing the canoes and instruments, and about four months' provisions, down to Belle Isle; about fifteen miles down the river from my house. This was to be our starting point for the Mackenzie River.

#### DESCRIPTION OF THE YUKON, ITS AFFLUENT STREAMS, AND THE ADJACENT COUNTRY.

I will now give, from my own observation and from information received, a more detailed description of the Lewes River, its affluent streams, and the resources of the adjacent country.

For the purpose of navigation a description of the Lewes River begins at the head of Lake Bennet. Above that point, and between it and Lake Lindeman, there is only about three-quarters of a mile of river, which is not more than fifty or sixty yards wide, and two or three feet deep, and is so swift and rough that navigation is out of the question.

Lake Lindeman is about five miles long and half a mile wide. It is deep enough for all ordinary purposes. Lake Bennet\* is twenty-six and a quarter miles long, for the upper fourteen of which it is about half a mile wide. About midway in its length an arm comes in from the west, which Schwatka appears to have mistaken for a river, and named Wheaton River. This arm is wider than the other arm down to that point, and is reported by Indians to be longer and heading in a glacier which lies in the pass at the head of Chilkoot Inlet. This arm is, as far as seen, surrounded by high mountains, apparently much higher than those on the arm we travelled down. Below the junction of the two arms the lake is about one and a half miles wide, with deep water. Above the forks the water of the east branch is muddy. This is caused by the streams from the numerous glaciers on the head of the tributaries of Lake Lindeman.

A stream which flows into Lake Bennet at the south-west corner is also very dirty, and has shoaled quite a large portion of the lake at its mouth. The beach at the lower end of this lake is comparatively flat and the water shoal. A deep, wide valley extends northwards from the north end of the lake, apparently reaching to the cañon, or a short distance above it. This may have been originally a course for the waters of the river. The bottom of the valley is wide and sandy, and covered with scrubby timber, principally poplar and pitch-pine. The waters of the lake empty at the extreme north-east angle through a channel not more than one hundred yards wide, which soon expands into what Schwatka called Lake Nares.† Through this narrow channel there is quite a current, and more than 7 feet of water, as a 6 foot paddle and a foot of arm added to its length did not reach the bottom.

\* A small saw-mill has been erected at the head of Lake Bennet; lumber for boat building sells at \$100 per M. Boats 25 feet long and 5 feet beam are \$60 each. Last year the ice broke up in the lake on the 12th June, but this season is earlier and the boats are expected to go down the lake about the 1st of June.

† The connecting waters between Lake Bennet and Tagish Lake constitute what is now called Caribou Crossing.

The hills at the upper end of Lake Lindeman rise abruptly from the water's edge. At the lower end they are neither so steep nor so high.

Lake Nares is only two and a half miles long, and its greatest width is about a mile; it is not deep, but is navigable for boats drawing 5 or 6 feet of water; it is separated from Lake Bennet by a shallow sandy point of not more than 200 yards in length.

No streams of any consequence empty into either of these lakes. A small river flows into Lake Bennet on the west side, a short distance north of the fork, and another at the extreme north-west angle, but neither of them is of any consequence in a navigable sense.

Lake Nares flows through a narrow curved channel into Bove Lake (Schwatka). This channel is not more than 600 or 700 yards long, and the water in it appears to be sufficiently deep for boats that could navigate the lake. The land between the lakes along this channel is low, swampy, and covered with willows, and, at the stage in which I saw it, did not rise more than 3 feet above the water. The hills on the south-west side slope up easily, and are not high; on the north side the deep valley already referred to borders it; and on the east side the mountains rise abruptly from the lake shore.

Bove Lake (called Tagish Lake by Dr. Dawson) is about a mile wide for the first two miles of its length, when it is joined by what the miners have called the Windy Arm. One of the Tagish Indians informed me they called it Takone Lake. Here the lake expands to a width of about two miles for a distance of some three miles, when it suddenly narrows to about half a mile for a distance of a little over a mile, after which it widens again to about a mile and a half or more.

Ten miles from the head of the lake it is joined by the Taku Arm from the south. This arm must be of considerable length, as it can be seen for a long distance, and its valley can be traced through the mountains much farther than the lake itself can be seen. It is apparently over a mile wide at its mouth or junction.

Dr. Dawson includes Bove Lake and these two arms under the common name of Tagish Lake. This is much more simple and comprehensive than the various names given them by travellers. These waters collectively are the fishing and hunting grounds of the Tagish Indians, and as they are really one body of water, there is no reason why they should not be all included under one name.

From the junction with the Taku Arm to the north end of the lake the distance is about six miles, the greater part being over two miles wide. The west side is very flat and shallow, so much so that it was impossible in many places to get our canoes to the shore, and quite a distance out in the lake there was not more than 5 feet of water. The members of my party who were in charge of the large boat and outfit, went down the east side of the lake and reported the depth about the same as I found on the west side, with many large rocks. They passed through it in the night in a rain storm, and were much alarmed for the safety of the boat and provisions. It would appear that this part of the lake requires some improvement to make it in keeping with the rest of the water system with which it is connected.

Where the river debouches from it, it is about 150 yards wide, and for a short distance not more than 5 or 6 feet deep. The depth is, however, soon increased to 10 feet or more, and so continues down to what Schwatka calls Marsh Lake. The miners call it Mud Lake, but on this name they do not appear to be agreed, many of them calling the lower part of Tagish or Bove Lake "Mud Lake," on account of its shallowness and flat muddy shores, as seen along the west side, the side nearly always travelled, as it is more sheltered from the prevailing southerly winds. The term "Mud Lake" is, however, not applicable to this lake, as only a comparatively small part of it is shallow or muddy; and it is nearly as inapplicable to Marsh Lake, as the latter is not markedly muddy along the west side, and from the appearance of the east shore one would not judge it to be so, as the banks appear to be high and gravelly.

Marsh Lake is a little over nineteen miles long, and averages about two miles in width. I tried to determine the width of it as I went along with my survey, by taking azimuths of points on the eastern shore from different stations of the survey; but in only one case did I succeed, as there were no prominent marks on that shore which could be identified from more than one place. The piece of river connecting Tagish and



Marsh Lakes is about five miles long, and averages 150 to 200 yards in width, and, as already mentioned, is deep, except for a short distance at the head. On it are situated the only Indian houses to be found in the interior with any pretention to skill in construction. They show much more labour and imitativeness than one knowing anything about the Indian in his native state would expect. The plan is evidently taken from the Indian houses on the coast, which appear to me to be a poor copy of the houses which the Hudson's Bay Company's servants build around their trading posts. These houses do not appear to have been used for some time past, and are almost in ruins. The Tagish Indians are now generally on the coast, as they find it much easier to live there than in their own country. As a matter of fact, what they make in their own country is taken from them by the Coast Indians, so that there is little inducement for them to remain.

The Lewes River, where it leaves Marsh Lake, is about 200 yards wide, and averages this width as far as the cañon. I did not try to find bottom anywhere as I went along, except where I had reason to think it shallow, and there I always tried with my paddle. I did not anywhere find bottom with this, which shows that there is no part of this stretch of the river with less than six feet of water at medium height, at which stage it appeared to me the river was at that time.

From the head of Lake Bennet to the cañon the corrected distance is ninety-five miles, all of which is navigable for boats drawing 5 feet or more. Add to this the westerly arm of Lake Bennet, and the Takone or Windy Arm of Tagish Lake, each about fifteen miles in length, and the Taku Arm of the latter lake, of unknown length, but probably not less than thirty miles, and we have a stretch of water of upwards of one hundred miles in length, all easily navigable; and, as has been pointed out, easily connected with Taiya Inlet through the White Pass.

No streams of any importance enter any of these lakes so far as I know. A river, called by Schwatka "McClintock River," enters Marsh Lake at the lower end from the east. It occupies a large valley, as seen from the westerly side of the lake, but the stream is apparently unimportant. Another small stream, apparently only a creek, enters the south-east angle of the lake. It is not probable that any stream coming from the east side of the lake is of importance, as the strip of country between the Lewes and Teslinto is not more than thirty or forty miles in width at this point.

The Taku Arm of Tagish Lake is, so far, with the exception of reports from Indians, unknown; but it is equally improbable that any river of importance enters it, as it is so near the source of the waters flowing northwards. However, this is a question that can only be decided by a proper exploration. The cañon I have already described and will only add that it is five-eighths of a mile long, about 100 feet wide, with perpendicular banks of basaltic rock from 60 to 100 feet high.

Below the cañon proper there is a stretch of rapids for about a mile; then about half a mile of smooth water, following which are the White Horse Rapids, which are three-eighths of a mile long, and unsafe for boats.

The total fall in the cañon and succeeding rapids was measured and found to be 32 feet. Were it ever necessary to make this part of the river navigable it will be no easy task to overcome the obstacles at this point; but a tram or railway could, with very little difficulty, be constructed along the east side of the river past the cañon.

For some distance below the White Horse Rapids the current is swift and the river wide, with many gravel bars. The reach between these rapids and Lake Labarge, a distance of twenty-seven and a half miles, is all smooth water, with a strong current. The average width is about 150 yards. There is no impediment to navigation other than the swift current, and this is no stronger than on the lower part of the river, which is already navigated; nor is it worse than on the Saskatchewan and Red Rivers in the more eastern part of our territory.

About midway in this stretch the Tahkeena River\* joins the Lewes. This river is, apparently, about half the size of the latter. Its waters are muddy, indicating its passage through a clayey district. I got some indefinite information about this river

\*The Tahkeena was formerly much used by the Chilkat Indians as a means of reaching the interior, but never by the miners owing to the distance from the sea to its head.

from an Indian who happened to meet me just below its mouth, but I could not readily make him understand me, and his replies were a compound of Chinook, Tagish, and signs, and therefore largely unintelligible. From what I could understand with any certainty, the river was easy to descend, there being no bad rapids, and it came out of a lake much larger than any I had yet passed.

Here I may remark that I have invariably found it difficult to get reliable or definite information from Indians. The reasons for this are many. Most of the Indians it has been my lot to meet are expecting to make something, and consequently are very chary about doing or saying anything unless they think they will be well rewarded for it. They are naturally very suspicious of strangers, and it takes some time, and some knowledge of their language, to overcome this suspicion and gain their confidence. If you begin at once to ask questions about their country, without previously having them understand that you have no unfriendly motive in doing so, they become alarmed, and although you may not meet with a positive refusal to answer questions, you make very little progress in getting desired information. On the other hand I have met cases where, either through fear or hope of reward, they were only too anxious to impart all they knew or had heard, and even more if they thought it would please their hearer. I need hardly say that such information is often not at all in accordance with the facts.

I have several times found that some act of mine when in their presence has aroused either their fear, superstition or cupidity. As an instance: on the Bell River I met some Indians coming down stream as I was going up. We were ashore at the time, and invited them to join us. They started to come in, but very slowly, and all the time kept a watchful eye on us. I noticed that my double-barrelled shot gun was lying at my feet, loaded, and picked it up to unload it, as I knew they would be handling it after landing. This alarmed them so much that it was some time before they came in, and I don't think they would have come ashore at all had they not heard that a party of whitemen, of whom we answered the description, were coming through that way (they had learned this from the Hudson's Bay Company's officers), and concluded we were the party described to them. After drinking some of our tea, and getting a supply for themselves, they became quite friendly and communicative.

Again, on the Mackenzie River, while two Indians were coming ashore at my camp, I picked up a telescope to look for a signal across the river. In looking for it I had to point it towards the Indians, who immediately turned and fled. Next day I called at the Indian encampment and explained through my interpreter what I had really done. When they understood it, it caused the camp much amusement.

At Fort Good Hope, on the Mackenzie, I heard of an old Indian who had been a great deal on the Hare River and could give valuable information regarding it. I asked to have him brought in, that I might question him. In the meantime I set about getting an observation for azimuth, and was busy observing when he came. The interpreter asked me what I was doing; I told him. He asked what I was looking up so much for; I said I was looking at a star. As the time was early in the evening, and the sun well up in the sky, he at first doubted my statement, but, finally believing, he explained to the Indians around what I was doing, and pointed out to them where the star was. They looked up in an awed manner, and walked off. When I finished my observation and inquired for the old man, I was told that he was not inclined to see me. I found him, but he refused to answer any questions, saying that there was no use in telling me anything, for when I could see stars during daylight I could just as easily see all the river, and nothing could convince him to the contrary.

I cite these as instances of what one meets with who comes in contact with Indians, and of how trifles affect them. A sojourn of two or three days with them and the assistance of a common friend would do much to disabuse them of such ideas, but when you have no such aids you must not expect to make much progress.

Lake Labarge is thirty-one miles long. In the upper thirteen it varies from three to four miles in width; it then narrows to about two miles for a distance of seven miles, when it begins to widen again, and gradually expands to about two and a-half or three miles, the lower six miles of it maintaining the latter width. The survey was

carried along the western shore, and while so engaged I determined the width of the upper wide part by triangulation at two points, the width of the narrow middle part at three points, and the width of the lower part at three points. Dr. Dawson on his way out made a track survey of the eastern shore. The western shore is irregular in many places, being indented by large bays, especially at the upper and lower ends. These bays are, as a rule, shallow, more especially those at the lower end.

Just above where the lake narrows in the middle there is a large island. It is three and a-half miles long and about half a mile in width. It is shown on Schwatka's map as a peninsula, and called by him Richtofen Rocks. How he came to think it a peninsula I cannot understand, as it is well out in the lake; the nearest point of it to the western shore is upwards of half a mile distant, and the extreme width of the lake here is not more than five miles, which includes the depth of the deepest bays on the western side. It is therefore difficult to understand that he did not see it as an island. The upper half of this island is gravelly, and does not rise very high above the lake. The lower end is rocky and high, the rock being of a bright red colour.

At the lower end of the lake there is a large valley extending northwards, which has evidently at one time been the outlet of the lake. Dr. Dawson has noted it and its peculiarities. His remarks regarding it will be found on pages 156-160 of his report entitled "Yukon District and Northern portion of British Columbia," published in 1889.

The width of the Lewes River as it leaves the lake is the same as at its entrance, about 200 yards. Its waters when I was there were murky. This is caused by the action of the waves on the shore along the lower end of the lake. The water at the upper end and at the middle of the lake is quite clear, so much so that the bottom can be distinctly seen at a depth of 6 or 7 feet. The wind blows almost constantly down this lake, and in a high wind it gets very rough. The miners complain of much detention owing to this cause, and certainly I cannot complain of a lack of wind while I was on the lake. This lake was named after one Mike Labarge, who was engaged by the Western Union Telegraph Company, exploring the river and adjacent country for the purpose of connecting Europe and America by telegraph through British Columbia, and Alaska, and across Bering Strait to Asia, and thence to Europe. This exploration took place in 1867, but it does not appear that Labarge then, nor for some years after, saw the lake called by his name. The successful laying of the Atlantic cable in 1866 put a stop to this project, and the exploring parties sent out were recalled as soon as word could be got to them. It seems that Labarge had got up as far as the Pelly before he received his recall; he had heard something of a large lake some distance further up the river, and afterwards spoke of it to some traders and miners who called it after him.

After leaving Lake Labarge the river, for a distance of about five miles, preserves a generally uniform width and an easy current of about four miles per hour. It then makes a short turn round a low gravel point, and flows in exactly the opposite of its general course for a mile when it again turns sharply to its general direction. The current around this curve and for some distance below it—in all four or five miles—is very swift. I timed it in several places and found it from six to seven miles an hour. It then moderates to four or five, and continues so until the Teslinto River is reached, thirty-one and seven-tenths miles from Lake Labarge. The average width of this part of the river is about 150 yards, and the depth is sufficient to afford passage for boats drawing at least 5 feet. It is, as a rule, crooked, and consequently a little difficult to navigate.

The Teslinto\* was so called by Dr. Dawson—this, according to information obtained by him, being the Indian name. It is called by the miners "Hootalinkwa" or Hotalinqua, and was called by Schwatka, who appears to have bestowed no other

\* The limited amount of prospecting that has been done on this river is said to be very satisfactory, fine gold having been found in all parts of the river. The lack of supplies is the great drawback to its development, and this will not be overcome to any extent until by some means heavy freight can be brought over the coast range to the head of the river. Indeed, owing to the difficulties attending access and transportation, the great drawback to the entire Yukon district at present is the want of heavy mining machinery and the scarcity of supplies. The government being aware of the requirements and possibilities of the country, has undertaken the task of making preliminary surveys for trails and railroads, and no doubt in the near future the avenue for better and quicker transportation facilities will be opened up.

attention to it, the Newberry, although it is apparently much larger than the Lewes. This was so apparent that in my interim reports I stated it as a fact. Owing to circumstances already narrated, I had not time while at the mouth to make any measurement to determine the relative size of the rivers; but on his way out Dr. Dawson made these measurements, and his report, before referred to, gives the following values of the cross sections of each stream: Lewes, 3,015 feet; Teslinto, 3,809 feet. In the same connection he states that the Lewes appeared to be about 1 foot above its lowest summer level, while the Teslinto appeared to be at its lowest level. Assuming this to be so, and taking his widths as our data, it would reduce his cross section of the Lewes to 2,595 feet. Owing, however, to the current in the Lewes, as determined by Dr. Dawson, being just double that of the Teslinto, the figures being 5.68 and 2.88 miles per hour, respectively, the discharge of the Lewes, taking these figures again, is 18,644 feet, and of the Teslinto 11,436 feet. To reduce the Lewes to its lowest level the doctor says would make its discharge 15,600 feet.

The water of the Teslinto is of a dark brown colour, similar in appearance to the Ottawa River water, and a little turbid. Notwithstanding the difference of volume of discharge, the Teslinto changes completely the character of the river below the junction, and a person coming up the river would, at the forks, unhesitatingly pronounce the Teslinto the main stream. The water of the Lewes is blue in colour, and at the time I speak of was somewhat dirty—not enough so, however, to prevent one seeing to a depth of two or three feet.

At the junction of the Lewes and Teslinto I met two or three families of the Indians who hunt in the vicinity. One of them could speak a little Chinook. As I had two men with me who understood his jargon perfectly, with their assistance I tried to get some information from him about the river. He told me the river was easy to ascend, and presented the same appearance eight days journey up as at the mouth; then a lake was reached, which took one day to cross; the river was then followed again for half a day to another lake, which took two days to traverse; into this lake emptied a stream which they used as a highway to the coast, passing by way of the Taku River. He said it took four days when they had loads to carry, from the head of canoe navigation on the Teslinto to salt water on the Taku Inlet; but when they come light they take only one to two days. He spoke also of a stream entering the large lake from the east which came from a distance; but they did not seem to know much about it, and considered it outside their country. If their time intervals are approximately accurate, they mean that there are about 200 miles of good river to the first lake, as they ought easily to make 25 miles a day on the river as I saw it. The lake takes one day to traverse, and is at least 25 miles long, followed by say 12 of river, which brings us to the large lake, which takes two days to cross, say 50 or 60 more—in all about 292 miles—say 300 to the head of canoe navigation; while the distance from the head of Lake Bennet to the junction is only 188. Assuming the course of the Teslinto to be nearly south (it is a little to the east of it), and throwing out every fourth mile for bends, the remainder gives us in arc three degrees and a quarter of latitude, which, deducted from  $61^{\circ} 40'$ , the latitude of the junction, gives us  $58^{\circ} 25'$ , or nearly the latitude of Juneau.

To make sure that I understood the Indian aright, and that he knew what he was speaking about, I got him to sketch the river and lake, as he described them, on the sand, and to repeat the same several times.

I afterwards met Mr. T. Boswell, his brother, and another miner, who had spent most of the summer on the river prospecting, and from them I gathered the following: The distance to the first, and only lake which they saw, they put at 175 miles, and the lake itself they call at least 150 miles long, as it took them four days to row in a light boat from end to end. The portage to the sea they did not appear to know anything about, but describe a large bay on the east side of the lake, into which a river of considerable size entered. This river occupies a wide valley, surrounded by high mountains. They thought this river must head near Liard River. This account differs materially from that given by the Indian, and to put them on their guard, I told them what he had told me, but they still persisted in their story, which I find differs a good deal from the account they gave Dr. Dawson, as incorporated in his report.

Many years ago, sixteen I think, a man named Monroe prospected up the Taku and learned from the Indians something of a large lake not far from that river. He crossed over and found it, and spent some time in prospecting, and then recrossed to the sea. This man had been at Forty Mile River, and I heard from the miners there his account of the appearance of the lake, which amounted generally to this : "The Boswells did not know anything about it." It was unfortunate the Boswells did not remain at Forty Mile all winter, as by a comparison of recollections they might have arrived at some correct conclusion.

Conflicting as these descriptions are, one thing is certain : this branch, if it has not the greater discharge, is the longer and more important of the two, and offers easy and uninterrupted navigation for more than double the distance which the Lewes does, the cañon being only ninety miles above the mouth of the Teslinto. The Boswells reported it as containing much more useful timber than the Lewes, which indeed one would infer from its lower altitude.

Assuming this as the main river, and adding its length to the Lewes-Yukon below the junction, gives upwards of 2,200 miles of river, fully two-thirds of which runs through a very mountainous country, without an impediment to navigation.

Some indefinite information was obtained as to the position of this river in the neighbourhood of Marsh Lake tending to show that the distance between them was only about thirty or forty miles.

Between the Teslinto and the Big Salmon, so called by the miners, or D'Abbadie by Schwatka, the distance is thirty-three and a-half miles, in which the Lewes preserves a generally uniform width and current. For a few miles below the Teslinto it is a little over the ordinary width, but then contracts to about two hundred yards which it maintains with little variation. The current is generally from four to five miles per hour.

The Big Salmon I found to be about one hundred yards wide near the mouth, the depth not more than four or five feet, and the current, so far as could be seen, sluggish. None of the miners I met could give me any information concerning this stream ; but Dr. Dawson was more fortunate, and met a man who had spent most of the summer of 1887 prospecting on it. His opinion was that it might be navigable for small stern-wheel steamers for many miles. The valley, as seen from the mouth, is wide, and gives one the impression of being occupied by a much more important stream. Looking up it, in the distance could be seen many high peaks covered with snow. As the date was August it is likely they are always so covered, which would make their probable altitude above the river 5,000 feet or more.

Dr. Dawson, in his report, incorporates fully the notes obtained from the miners. I will trespass so far on these as to say that they called the distance to a small lake near the head of the river, 190 miles from the mouth. This lake was estimated to be four miles in length ; another lake about 12 miles above this was estimated to be twenty-four miles long, and its upper end distant only about eight miles from the Teslinto. These distances, if correct, make this river much more important than a casual glance at it would indicate ; this, however, will be more fully spoken of under its proper head.

Just below the Big Salmon the Lewes takes a bend of nearly a right angle. Its course from the junction with the Tahkeena to this point is generally a little east of north ; at this point it turns to nearly west for some distance. Its course between here and its confluence with the Pelly is north-west, and, I may add, it preserves this general direction down to the confluence with the Porcupine. The river also changes in another respect ; it is generally wider, and often expands into what might be called lakes, in which are islands. Some of the lakes are of considerable length, and well timbered.

To determine which channel is the main one, that is, which carries the greatest volume of water, or is best available for the purposes of navigation, among these islands, would require more time than I could devote to it on my way down ; consequently I cannot say more than that I have no reason to doubt that a channel giving six feet or more of water could easily be found. Whenever, in the main channel, I had reason to

think the water shallow, I tried it with my paddle, but always failed to find bottom, which gives upwards of six feet. Of course I often found less than this, but not in what I considered the main channel.

Thirty-six and a quarter miles below the Big Salmon, the Little Salmon—the Daly of Schwatka—enters the Lewes. This river is about 60 yards wide at the mouth, and not more than two or three feet in depth. The water is clear and of a brownish hue; there is not much current at the mouth, nor as far as can be seen up the stream. The valley which, from the mouth, does not appear extensive, bears north-east for some distance, when it appears to turn more to the east. Six or seven miles up, and apparently on the north side, some high cliffs of red rock, apparently granite, can be seen. It is said that some miners have prospected this stream, but I could learn nothing definite about it.

Lewes River makes a turn here to the south-west, and runs in that direction six miles, when it again turns to the north-west for seven miles, and then makes a short, sharp turn to the south and west around a low sandy point, which will, at some day in the near future, be cut through by the current, which will shorten the river three or four miles.

Eight miles below Little Salmon River, a large rock called the Eagle's Nest, stands up in a gravel slope on the easterly bank of the river. It rises about five hundred feet above the river, and is composed of a light grey stone. What the character of this rock is I could not observe, as I saw it only from the river, which is about a quarter of a mile distant. On the westerly side of the river there are two or three other isolated masses of apparently the same kind of rock. One of them might appropriately be called a mountain; it is south-west from the Eagle's Nest and distant from it about three miles.

Thirty-two miles below Eagle's Nest Rock, Nordenskiöld River enters from the west. It is an unimportant stream, being not more than one hundred and twenty feet wide at the mouth, and only a few inches deep. The valley, as far as can be seen, is not extensive, and, being very crooked, it is hard to tell what its general direction is.

The Lewes, between the Little Salmon and the Nordenskiöld, maintains a width of from two to three hundred yards, with an occasional expansion where there are islands. It is serpentine in its course most of the way, and where the Nordenskiöld joins it is very crooked, running several times under a hill, named by Schwatka Tantalus Butte, and in other places leaving it, for a distance of eight miles. The distance across from point to point is only half a mile.

Below this to Five Finger Rapids, so-called from the fact that five large masses of rock stand in mid-channel, the river assumes its ordinary straightness and width, with a current from four to five miles per hour. I have already described Five Finger Rapids; I do not think they will prove anything more than a slight obstruction in the navigation of the river. A boat of ordinary power would probably have to help herself up with windlass and line in high water.

Below the rapids, for about two miles, the current is strong—probably six miles per hour—but the water seems to be deep enough for any boat that is likely to navigate it.

Six miles below this, as already noticed, Rink Rapids are situated. They are of no great importance, the westerly half of the stream only being obstructed. The easterly half is not in any way affected, the current being smooth and the water deep.

Below Five Finger Rapids about two miles a small stream enters from the east. It is called by Dr. Dawson Tatshun River. It is not more than 30 or 40 feet wide at the mouth, and contains only a little clear, brownish water. Here I met the only Indians seen on the river between Teslinto and Stewart Rivers. They were engaged in catching salmon at the mouth of the Tatshun, and were the poorest and most unintelligent Indians it has ever been my lot to meet. It is needless to say that none of our party understood anything they said, as they could not speak a word of any language but their own. I tried by signs to get some information from them about the stream they were fishing in, but failed. I tried in the same way to learn if there were any more Indians in the vicinity, but again utterly failed. I then tried by signs to find out how many

days it took to go down to Pelly River, but although I have never known these signs to fail in eliciting information in any other part of the territory, they did not understand. They appeared to be alarmed by our presence ; and, as we had not yet been assured as to the rumour concerning the trouble between the miners and Indians, we felt a little apprehensive, but being able to learn nothing from them we had to put our fears aside and proceed blindly.

Between Five Finger Rapids and Pelly River, fifty-eight and a half miles, no streams of any importance enter the Lewes ; in fact, with the exception of the Tatshun, it may be said that none at all enter.

About a mile below Rink Rapids the river spreads out into a lake-like expanse, with many islands ; this continues for about three miles, when it contracts to something like the usual width ; but bars and small islands are very numerous all the way to Pelly River. About five miles above Pelly River there is another lake-like expanse filled with islands. The river here for three or four miles is nearly a mile wide, and so numerous and close are the islands that it is impossible to tell when floating among them where the shores of the river are. The current, too, is swift, leading one to suppose the water shallow ; but I think even here a channel deep enough for such boats as will navigate this part of the river can be found. Schwatka named this group of islands "Ingersoll Islands."

At the mouth of the Pelly the Lewes is about half a mile wide, and here too there are many islands, but not in groups as at Ingersoll Islands.

About a mile below the Pelly, just at the ruins of Fort Selkirk, the Yukon was found to be 565 yards wide ; about two-thirds being ten feet deep, with a current of about four and three-quarter miles per hour ; the remaining third was more than half taken up by a bar, and the current between it and the south shore was very slack.

Pelly River at its mouth is about two hundred yards wide, and continues this width as far up as could be seen. Dr. Dawson made a survey and examination of this river, which will be found in his report already cited, "Yukon District and Northern British Columbia."

Just here for a short distance the course of the Yukon is nearly west, and on the south side, about a mile below the mouth of the Lewes, stands all that remains of the only trading post ever built by white men in the district. This post was established by Robert Campbell, for the Hudson's Bay Company, in the summer of 1848. It was first built on the point of land between the two rivers, but this location proving untenable on account of flooding by ice jams in the spring, it was, in the season of 1852, moved across the river to where the ruins now stand. It appears that the houses composing the post were not finished when the Indians from the coast on Chilkat and Chilkoot Inlets came down the river to put a stop to the competitive trade which Mr. Campbell had inaugurated, and which they found to seriously interfere with their profits. Their method of trade appears to have been then pretty much as it is now—very one-sided. What they found it convenient to take by force they took, and what it was convenient to pay for at their own price they paid for.

Rumours had reached the post that the coast Indians contemplated such a raid, and in consequence the native Indians in the vicinity remained about nearly all summer. Unfortunately, they went away for a short time, and during their absence the coast Indians arrived in the early morning, and surprised Mr. Campbell in bed. They were not at all rough with him, but gave him the privilege of leaving the place within twenty-four hours, after which he was informed that he was liable to be shot if seen by them in the locality. They then pillaged the place and set fire to it, leaving nothing but the remains of the two chimneys which are still standing. This raid and capture took place on the 1st August, 1852.

Mr. Campbell dropped down the river, and met some of the local Indians who returned with him, but the robbers had made their escape. I have heard that the local Indians wished to pursue and overtake them, but to this Mr. Campbell would not consent. Had they done so it is probable not many of the raiders would have escaped, as the superior local knowledge of the natives would have given them an advantage

difficult to estimate, and the confidence and spirit derived from the aid and presence of a white man or two would be worth much in such a conflict.

Mr. Campbell went on down the river until he met the outfit for his post on its way up from Fort Yukon, which he turned back. He then ascended the Pelly, crossed to the Liard, and reached Fort Simpson, on the Mackenzie, late in October.

Mr. Campbell's first visit to the site of Fort Selkirk was made in 1840, under instructions from Sir George Simpson, then Governor of the Hudson's Bay Company. He crossed from the head waters of the Liard to the waters of the Pelly. It appears the Pelly, where he struck it, was a stream of considerable size, for he speaks of its appearance when he first saw it from "Pelly Banks," the name given the bank from which he first beheld it, as a "splendid river in the distance." In June, 1843, he descended the Pelly to its confluence with the larger stream, which he named the "Lewes." Here he found many families of the native Indians—"Wood Indians," he called them. These people conveyed to him, as best they could by word and sign, the dangers that would attend a further descent of the river, representing that the country below theirs was inhabited by a tribe of fierce cannibals, who would assuredly kill and eat them. This so terrified his men that he had to return by the way he came, pursued, as he afterwards learned, by the Indians, who would have murdered himself and party had they got a favourable opportunity. Thus it was not until 1850 that he could establish, what he says he all along believed, "that the Pelly and Yukon were identical." This he did by descending the river to where the Porcupine joins it, and where in 1847 Fort Yukon was established by Mr. A. H. Murray for the Hudson's Bay Company.

With reference to the tales told him by the Indians of bad people outside of their country, I may say that Mackenzie tells pretty much the same story of the Indians on the Mackenzie when he discovered and explored that river in 1789. He had the advantage of having Indians along with him whose language was radically the same as that of the people he was coming among, and his statements are more explicit and detailed. Everywhere he came in contact with them they manifested, first, dread of himself and party, and when friendship and confidence were established they nearly always tried to detain him by representing the people in the direction he was going as unnaturally bloodthirsty and cruel, sometimes asserting the existence of monsters with supernatural powers, as at Manitou Island, a few miles below the present Fort Good Hope, and the people on a very large river far to the west of the Mackenzie, probably the Yukon, they described to him as monsters in size, power and cruelty.

In our own time, after the intercourse that there has been between them and the whites, more than a suspicion of such unknown, cruel people lurks in the minds of many of the Indians. It would be futile for me to try to ascribe an origin for these fears, my knowledge of their language and idiosyncrasies being so limited.

Nothing more was ever done in the vicinity of Fort Selkirk\* by the Hudson's Bay Company after these events, and in 1869 the Company was ordered by Capt. Charles W. Raymond, who represented the United States Government, to evacuate the post at Fort Yukon, he having found that it was west of the 141st meridian. The post was occupied by the Company, however, for some time after the receipt of this order, and until Rampart House was built, which was intended to be on British territory, and to take the trade previously done at Fort Yukon.

Under present conditions the Company cannot very well compete with the Alaska Commercial Company, whose agents do the only trade in the district,† and they appear to have abandoned—for the present at least—all attempt to do any trade nearer to it than Rampart House, to which point, notwithstanding the distance and difficulties in the way, many of the Indians on the Yukon make a trip every two or three years to procure goods in exchange for their furs. The clothing and blankets brought in by the

\* This is now a winter port for steamboats of the North American Transportation and Trading Company, plying the Yukon and its tributaries. There is also a trading post here owned by Harper who was at one time of the firm of Harper & McQuestion, traders.

† Since the date of this report the North American Transportation and Trading Company, better known in the Yukon Valley as "Captain Healy's Company" has established a number of posts on the river.



Hudson's Bay Company they claim are much better than those traded on their own river by the Americans. Those of them that I saw who had any English blankets exhibited them with pride, and exclaimed "good." They point to an American blanket in contempt, with the remark "no good," and speak of their clothing in the same way.

On many maps of Alaska a place named "Reed's House" is shown on or near the upper waters of Stewart River. I made enquiries of all whom I thought likely to know anything concerning this post, but failed to elicit any information showing that there ever had been such a place. I enquired of Mr. Reid, who was in the Company's service with Mr. Campbell at Fort Selkirk, and after whom I thought, possibly, the place had been called, but he told me he knew of no such post, but that there was a small lake at some distance in a northerly direction from Fort Selkirk, where fish were procured. A sort of shelter had been made at that point for the fishermen, and a few furs might have been obtained there, but it was never regarded as a trading post.

Below Fort Selkirk, the Yukon River is from five to six hundred yards broad, and maintains this width down to White River, a distance of ninety-six miles. Islands are numerous, so much so that there are very few parts of the river where there are not one or more in sight. Many of them are of considerable size, and nearly all are well timbered. Bars are also numerous, but almost all are composed of gravel, so that navigators will not have to complain of shifting sand bars. The current as a general thing, is not so rapid as in the upper part of the river, averaging about four miles per hour. The depth in the main channel was always found to be more than six feet.

From Pelly River to within twelve miles of White River the general course of the river is a little north of west; it then turns to the north, and the general course as far as the site of Fort Reliance is due north.

White River enters the main river from the west. At the mouth it is about two hundred yards wide, but a great part of it is filled with ever-shifting sand-bars, the main volume of water being confined to a channel not more than one hundred yards in width. The current is very strong, certainly not less than eight miles per hour. The colour of the water bears witness to this, as it is much the muddiest that I have ever seen.\*

I had intended to make a survey of part of this river as far as the International Boundary, and attempted to do so; but after trying for over half a day, I found it would be a task of much labour and time, altogether out of proportion to the importance of the end sought, and therefore abandoned it. The valley as far as can be seen from the mouth, runs about due west for a distance of eight miles; it then appears to bear to the south-west; it is about two miles wide where it joins the Pelly valley and apparently keeps the same width as far as it can be seen.

Mr. Harper, of the firm of Harper, McQuestion & Co., went up this river with sleds in the fall of 1872 a distance of fifty or sixty miles. He describes it as possessing the same general features all the way up, with much clay soil along its banks. Its general course, as sketched by him on a map of mine, is for a distance of about thirty miles a little north-west, thence south-west thirty or thirty-five miles, when it deflects to the north-west running along the base of a high mountain ridge. If the courses given are correct it must rise somewhere near the head of Forty Mile River; and if so, its length is not at all in keeping with the volume of its discharge, when compared with the known length and discharge of other rivers in the territory. Mr. Harper mentioned an extensive flat south of the mountain range spoken of, across which many high mountain peaks could be seen. One of these he thought must be Mount St. Elias, as it overtopped all the others; but, as Mount St. Elias is about one hundred and eighty miles distant, his conclusion is not tenable. From his description of this mountain it must be more than twice the height of the highest peaks seen anywhere on the lower river, and consequently must be ten or twelve thousand feet above the sea. He stated that the

\* The White River very probably flows over volcanic deposits as its sediments would indicate; no doubt this would account for the discolouration of its waters. The volcanic ash appears to cover a great extent of the Upper Yukon basin drained by the Lewes and Pelly Rivers. Very full treatment of the subject is given by Dr. Dawson, in his report entitled "Yukon District and Northern portion of British Columbia."

current in the river was very swift, as far as he ascended, and the water muddy. The water from this river, though probably not a fourth of the volume of the Yukon, discolours the water of the latter completely; and a couple of miles below the junction the whole river appears almost as dirty as White River.

Between White and Stewart Rivers, ten miles, the river spreads out to a mile and upwards in width, and is a maze of islands and bars. The survey was carried down the easterly shore, and many of the channels passed through barely afforded water enough to float the canoes. The main channel is along the westerly shore, down which the large boat went, and the crew reported plenty of water.

Stewart River enters from the east in the middle of a wide valley, with low hills on both sides, rising on the north side in steps or terraces to distant hills of considerable height. The river half a mile or so above the mouth, is two hundred yards in width. The current is slack and the water shallow and clear, but dark coloured.

While at the mouth I was fortunate enough to meet a miner who had spent the whole of the summer of 1887 on the river and its branches prospecting and exploring. He gave me a good deal of information of which I give a summary. He is a native of New Brunswick, Alexander McDonald by name, and has spent some years mining in other places, but was very reticent about what he had made or found. Sixty or seventy miles up the Stewart a large creek enters from the south which he called Rose Bud Creek or River, and thirty or forty miles further up a considerable stream flows from the north-east, which appears to be Beaver River, as marked on the maps of that part of the country. From the head of this stream he floated down on a raft taking five days to do so. He estimated his progress at forty or fifty miles each day, which gives a length of from two hundred to two hundred and fifty miles. This is probably an over estimate, unless the stream is very crooked, which, he stated, was not the case. As much of his time would be taken up in prospecting, I should call thirty miles or less a closer estimate of his progress. This river is from fifty to eighty yards wide and was never more than four or five feet deep, often being not more than two or three; the current, he said, was not at all swift. Above the mouth of this stream the main river is from one hundred to one hundred and thirty yards wide with an even current and clear water. Sixty or seventy miles above the last mentioned branch another large branch joins, which is possibly the main river. At the head of it he found a lake nearly thirty miles long, and averaging a mile and a half in width, which he called Mayhew Lake, after one of the partners in the firm of Harper, McQuestion & Co.

Thirty miles or so above the forks on the other branch there are falls, which McDonald estimated to be from one to two hundred feet in height. I met several parties who had seen these falls, and they corroborate this estimate of their height. McDonald went on past the falls to the head of this branch and found terraced gravel hills to the west and north; he crossed them to the north and found a river flowing northward. On this he embarked on a raft and floated down it for a day or two, thinking it would turn to the west and join the Stewart, but finding it still continuing north, and acquiring too much volume to be any of the branches he had seen while passing up the Stewart, he returned to the point of his departure, and after prospecting among the hills around the head of the river, he started westward, crossing a high range of mountains composed principally of shales with many thin seams of what he called quartz, ranging from one to six inches in thickness.

On the west side of this range he found a river flowing out of what he called Mayhew Lake, and crossing this got to the head of Beaver River, which he descended as before mentioned.

It is probable the river flowing northwards, on which he made a journey and returned, was a branch of Peel River. He described the timber on the gravel terraces of the watershed as small and open. He was alone in this unknown wilderness all summer, not seeing even any of the natives. There are few men so constituted as to be capable of isolating themselves in such a manner. Judging from all I could learn it is probable a light draught steamboat could navigate nearly all of Stewart River and its tributaries.

From Stewart River to the site of Fort Reliance,\* seventy-three and a quarter miles, the Yukon is broad and full of islands. The average width is between a half and three quarters of a mile, but there are many expansions where it is over a mile in breadth; however, in these places it cannot be said that the waterway is wider than at other parts of the river, the islands being so large and numerous. In this reach no streams of any importance enter.

About thirteen miles below Stewart River a large valley joins that of the river, but the stream occupying it is only a large creek. This agrees in position with what has been called Sixty Mile Creek, which was supposed to be about that distance above Fort Reliance, but it does not agree with descriptions which I received of it; moreover as Sixty Mile Creek is known to be a stream of considerable length, this creek would not answer its description.

Twenty-two and a half miles from Stewart River another and larger creek enters from the same side; it agrees with the descriptions of Sixty Mile Creek, and I have so marked it on my map. This stream is of no importance, except for what mineral wealth may be found on it.†

Six and a half miles above Fort Reliance the Thron-Diuck‡ River of the Indians (Deer River of Schwatka) enters from the east. It is a small river about forty yards wide at the mouth, and shallow; the water is clear and transparent, and of beautiful blue colour. The Indians catch great numbers of salmon here. They had been fishing shortly before my arrival, and the river, for some distance up, was full of salmon traps.

A miner had prospected up this river for an estimated distance of forty miles, in the season of 1837. I did not see him, but got some of his information at second hand. The water being so beautifully clear I thought it must come through a large lake not far up; but as far as he had gone no lakes were seen. He said the current was comparatively slack, with an occasional "ripple" or small rapid. Where he turned back the river is surrounded by high mountains, which were then covered with snow, which accounts for the purity and clearness of the water.

It appears that the Indians go up this stream a long distance to hunt, but I could learn nothing definite as to their statements concerning it.

Twelve and a half miles below Fort Reliance, the Chandindu River, as named by Schwatka, enters from the east. It is thirty to forty yards wide at the mouth, very shallow, and for half a mile up is one continuous rapid. Its valley is wide and can be seen for a long distance looking north-eastward from the mouth.

Between Fort Reliance and Forty Mile River (called Cone Hill River by Schwatka) the Yukon assumes its normal appearance, having fewer islands and being narrower, averaging four to six hundred yards wide, and the current being more regular. This stretch is forty-six miles long, but was estimated by the traders at forty, from which the Forty Mile River took its name.

\*This was at one time a trading post occupied by Messrs. Harper & McQuestion.

†Sixty Mile Creek is about one hundred miles long, very crooked, with a swift current and many rapids, and is therefore not easy to ascend.

Miller, Glacier, Gold, Little Gold and Bedrock Creeks are all tributaries of Sixty Mile. Some of the richest discoveries in gold so far made in the interior since 1894 have been upon these creeks, especially has this been the case upon the two first mentioned. There is a claim upon Miller Creek owned by Joseph Boudreau from which over \$100,000 worth of gold is said to have been taken out.

Freight for the mines is taken up Forty Mile Creek in summer for a distance of 30 miles, then portaged across to the heads of Miller and Glacier Creeks. In the winter it is hauled in by dogs.

The trip from Cudahy to the post at the mouth of Sixty Mile River is made by ascending Forty Mile River a small distance, making a short portage to Sixty Mile River and running down with its swift current. Coming back on the Yukon, nearly the whole of the round trip is made down stream.

Indian Creek enters the Yukon from the east about 30 miles below Sixty Mile. It is reported to be rich in gold, but owing to the scarcity of supplies its development has been retarded.

At the mouth of Sixty Mile Creek a townsite of that name is located, it is the headquarters for upwards of 100 miners and where they more or less assemble in the winter months.

Messrs. Harper & Co. have a trading post and a saw-mill on an island at the mouth of the creek, both of which are in charge of Mr. J. Leduc, one of the partners of the firm, and who was at one time in the employ of the Alaska Commercial Company.

‡Dawson City is situated at the mouth of the Thron-Diuck and although it was located only a few months ago it is the scene of great activity. Very rich deposits of gold have been lately found on Bonanza Creek and other affluents of the Thron-Diuck.

Forty Mile River\* joins the main river from the west. Its general course as far up as the International Boundary, a distance of twenty-three miles, is south-west ; after this it is reported by the miners to run nearer south. Many of them claim to have ascended this stream for more than one hundred miles, and speak of it there as quite a large river. They say that at that distance it has reached the level of the plateau, and the country adjoining it they describe as flat and swampy, rising very little above the river. It is only a short distance across to the Tanana River—a large tributary of the Yukon—which is here described as an important stream. However, only about twenty-three miles of Forty Mile River are in Canada ; and the upper part of it and its relation to other rivers in the district have no direct interest for us.

Forty Mile River is one hundred to one hundred and fifty yards wide at the mouth, and the current is generally strong, with many small rapids. Eight miles up is the so-called cañon ; it is hardly entitled to that distinctive name, being simply a crooked contraction of the river, with steep rocky banks, and on the north side there is plenty of room to walk along the beach. At the lower end of the cañon there is a short turn and swift water in which are some large rocks ; these cannot generally be seen, and there is much danger of striking them running down in a boat. At this point several miners have been drowned by their boats being upset in collision with these rocks. It is no great distance to either shore, and one would think an ordinary swimmer would have no difficulty in reaching land ; but the coldness of the water soon benumbs a man completely and renders him powerless. In the summer of 1887, an Indian, from Tanana, with his family, was coming down to trade at the post at the mouth of Forty Mile River ; his canoe struck on these rocks and upset, and he was thrown clear of the canoe, but the woman and children clung to it. In the rough water he lost sight of them, and concluded that they were lost : it is said he deliberately drew his knife and cut his throat, thus perishing, while his family were hauled ashore by some miners. The chief of the band to which this Indian belonged came to the post and demanded pay for his loss, which he contended was occasioned by the traders having moved from Belle Isle to Forty Mile, thus causing them to descend this dangerous rapid, and there is little doubt that had there not been so many white men in the vicinity he would have tried to enforce his demand.

The length of the so-called cañon is about a mile. Above it the river up to the boundary is generally smooth, with swift current and an occasional ripple. The amount of water discharged by this stream is considerable ; but there is no prospect of navigation, it being so swift and broken by small rapids.

From Forty Mile River to the boundary the Yukon preserves the same general character as between Fort Reliance and Forty Mile, the greatest width being about half a mile and the least about a quarter.

Fifteen miles below Forty Mile River a large mass of rock stands on the east bank. This was named by Schwatka "Roquette Rock," but is known to the traders as Old Woman Rock ; a similar mass, on the west side of the river, being known as Old Man Rock.

The origin of these names is an Indian legend, of which the following is the version given to me by the traders :—

In remote ages there lived a powerful shaman, pronounced Tshaumen by the Indians, this being the local name for what is known as medicine man among the Indians farther south and east. The Tshaumen holds a position and exercises an influence among the people he lives with, something akin to the wise men or magi of olden times

\*Forty Mile townsite is situated on the south side of the Forty Mile River at its junction with the Yukon. The Alaska Commercial Company has a station here which was for some years in charge of L. N. McQuestion ; there are also several blacksmith shops, restaurants, billiard halls, bakeries, an opera house and so on. Rather more than half a mile below Forty Mile townsite the town of Cudahy was founded on the north side of Forty Mile River in the summer of 1902. It is named after a well known member of the North American Transportation and Trading Company. In population and extent of business the town bears comparison with its neighbour across the river. The opposition in trade has been the means of very materially reducing the cost of supplies and living. The North American Transportation and Trading Company has erected a saw-mill and some large warehouses. Fort Constantine was established here immediately upon the arrival of the Mounted Police detachment in the latter part of July, 1895. It is described further on in an extract from Inspector Constantine's supplementary report for the year 1895.

in the East. In this powerful being's locality there lived a poor man who had the great misfortune to have an inveterate scold for a wife. He bore the infliction for a long time without murmuring, in hopes that she would relent, but time seemed only to increase the affliction; at length, growing weary of the unceasing torment, he complained to the Tshaumen, who comforted him, and sent him home with the assurance that all would soon be well.

Shortly after this he went out to hunt, and remained away for many days endeavouring to get some provisions for home use, but without avail; he returned weary and hungry, only to be met by his wife with a more than usually violent outburst of scolding. This so provoked him that he gathered all his strength and energy for one grand effort and gave her a kick that sent her clean across the river. On landing she was converted into the mass of rock which remains to this day a memorial of her viciousness and a warning to all future scolds. The metamorphosis was effected by the Tshaumen, but how the necessary force was acquired to send her across the river (here about half a mile wide), or whether the kick was administered by the Tshaumen or the husband, my narrator could not say. He was altogether at a loss to account for conversion of the husband into the mass of rock on the west side of the river; nor can I offer any theory unless it is that he was *petrified* by astonishment at the result.

Such legends as this would be of interest to ethnologists if they could be procured direct from the Indians, but repeated by men who have little or no knowledge of the utility of legendary lore, and less sympathy with it, they lose much of their value.

Between Forty Mile River and the boundary line no stream of any size joins the Yukon; in fact, there is only one stream, which some of the miners have named Sheep Creek, but as there is another stream further down the river, called by the same name, I have named it Coal Creek. It is five miles below Forty Mile, and comes in from the east, and is a large creek, but not at all navigable. On it some extensive coal seams were seen, which will be more fully referred to further on.

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At the boundary the river is somewhat contracted, and measures only 1,280 feet across in the winter; but in summer, at ordinary water level, it would be about one hundred feet wider. Immediately below the boundary it expands to its usual width, which is about 2,000 feet. The area of the cross section measured is 22,268 feet, the sectional area of the Teslintoo, as determined by Dr. Dawson and already referred to, is 3,809 feet; that of the Lewes at the Teslintoo, from the same authority, is 3,015 feet. Had the above cross-section been reduced to the level at which the water ordinarily stands during the summer months, instead of to the height at which it stood in the middle of September when it was almost at its lowest, the sectional area would have been at least 50 per cent more, and at spring flood level about double the above area.

It is a difficult matter to determine the actual discharge at the place of the cross-section, owing to the irregularity in the depth and current, the latter being in the deep channel at the east side, when I tried it in September, approximately 4.8 miles per hour; while on the bar in midstream it was not more than 2.5 miles per hour; and between the bar and the westerly shore there was very little current.

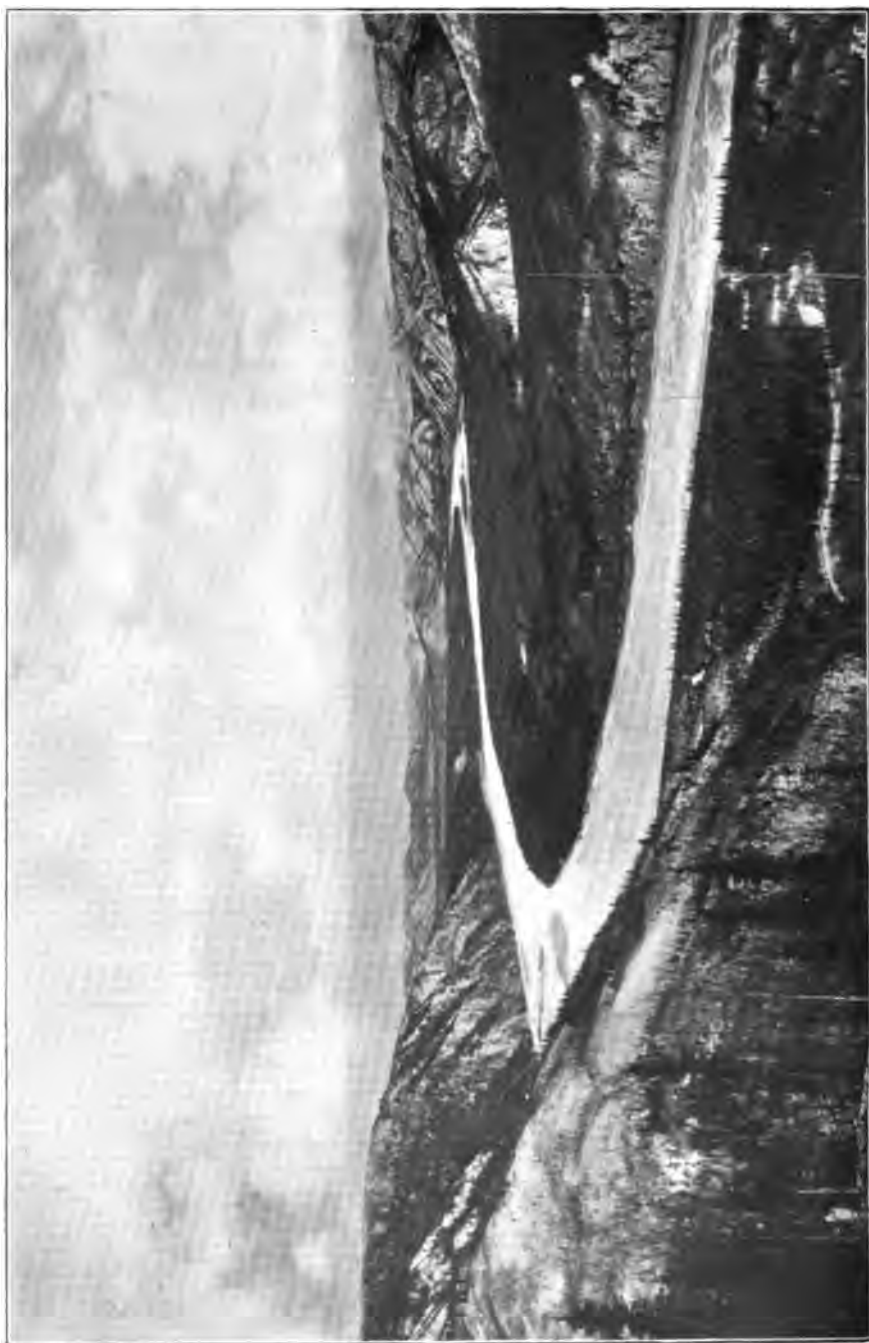
The river above this for some miles was no better for the purpose of cross-section measurement. At the boundary it is narrow and clear of bars and islands for some miles, but here I did not have an opportunity to determine the rate of the current before the river froze up, and after it froze the drift ice was jammed and piled so high that it would have been an almost endless task to cut holes through it.

Taking the sectional area of the deep part alone and the rate of current above stated, and calculating by the approximate formulæ used by Dr. Dawson, as given in Trautwine's Engineer's Pocket-Book, p. 562, the discharge in cubic feet per second is 90,864, or about three times that of the Lewes and Teslintoo together, as determined by Dr. Dawson. The discharge of the rest of the channel would approximate only 14,000 feet—in all about 105,000 feet. At summer level with an increased sectional area and current it would approximate 60 per cent more, or close to 170,000 feet per second. At high water level it would at least be eight to ten feet deeper, and we can only conjecture what the current



Canada.

Alaska.



International Boundary across the Yukon River (looking north).

would be, but I think it is safe to assume at least 80 per cent more discharge, which would give us roughly 300,000 feet per second. For the sake of comparison, I give the discharge of the St. Lawrence and Ottawa Rivers, being the mean of the years 1867 to 1882: St. Lawrence, mean 900,000 feet; Ottawa, at Grenville, mean 85,000 feet. The point where cross-section was measured is less than seven hundred miles from the head of Lewes River, and from the head of the Teslinto probably eight hundred.

The current, from the boundary down to the confluence with the Porcupine, is said to be strong, and much the same as that above; from the Porcupine down for a distance of five or six hundred miles it is called medium, and the remainder easy.

On the 22nd September a small steamboat named the "New Racket" passed my camp on her way up to Forty Mile River with supplies; she was about forty feet long and nine or ten feet beam, with about two feet draught. The boat was wholly taken up with engine and boiler, the berths for the crew being over the engine room. The propelling power was a stern wheel, driven by two engines of large size for such a small boat. It was claimed for her by her captain, A. Mayhew, of the firm of Harper, McQuestion & Co., that she could make ten miles an hour in dead water. She was then twenty-two days out from St. Michael Island, near the mouth of the river. Mr. Mayhew claimed that this was longer than usual, on account of the boiler tubes being out of order and leaking badly, so that it was impossible to keep more than fifty pounds pressure, while that generally used was about double. That this was true was apparent from the fact that it took her about five hours to make four miles; and at one place below my camp, she hung for over an hour without making any progress at all, nor could she pass that point until she stopped and bottled up steam.

After reaching Forty Mile River this boat started up the stream to Stewart River, with supplies for the few miners who intended to winter there, and materials for the Indian fur trade. Some miners, who intended to spend the summer of 1888 mining on Stewart River, took passage up on her; but after trying for nearly two days it was found impossible, loaded as she was, to make any headway, so she returned, discharged her passengers, and finally reached Stewart River light. Here the owners intended to lay her up and give her a thorough overhauling before the commencement of next season's navigation. Three other steamboats which navigate the river, the "Yukon," the "St. Michael" and the "Explorer," belong to the Alaska Commercial Company. These boats are small, and carry little or no freight themselves, but tow loaded barges. Their space is entirely devoted to engine and boiler, and they are driven by a stern wheel. Messrs. Harper, McQuestion & Co. expected the Alaska Commercial Company to put a larger boat on the river in the season of 1888; one that would carry one hundred and twenty to two hundred tons of freight, and make five to seven miles per hour up stream on the upper river. The other boats do not make more than three or four miles per hour, and often not that. None of these boats had passed Stewart River while I was there, nor is it probable they have since done so.

From Stewart River to the mouth of the Yukon is about 1,650 miles, and the only difficult place in all this distance is the part near the confluence with the Porcupine, which has evidently been a lake in past ages, but is now filled with islands; it is said that the current here is swift, and the channels generally narrow, rendering navigation difficult.

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#### AGRICULTURAL CAPABILITIES OF THE YUKON BASIN.

The agricultural capabilities of the country along the river are not great, nor is the land which can be seen from the river of good quality.

When we consider further the unsuitable climatic conditions which prevail in the region it may be said that as an agricultural district this portion of the country will never be of value.

My meteorological records show over eight degrees of frost on the 1st of August, over ten on the 3rd, and four times during the month the minimum temperature was below freezing. On the 13th September the minimum temperature was 16°, and all the minimum readings for the remainder of the month were below freezing.



Along the east side of Lake Bennet, opposite the Chilkoot or western arm, there are some flats of dry gravelly soil, which would make a few farms of limited extent. On the west side, around the mouth of Wheaton River, there is an extensive flat of sand and gravel, covered with small pine and spruce of stunted growth. The vegetation is poor and sparse, not at all what one would desire to see on a place upon which he was thinking of settling. At the lower end of the lake there is another extensive flat of sandy soil, thinly clad with small poplars and pines. The same remarks apply to this flat as to that at Wheaton River.

Along the westerly shore of Tagish Lake there is a large extent of low, swampy flats, a part of which might be used for the production of such roots and cereals as the climate would permit. Along the west side of Marsh Lake there is also much flat surface of the same general character, on which I saw some coarse grass which would serve as food for cattle. Along the east side the surface appeared higher and terraced, and is probably less suited to the requirements of the agriculturalist. Along the head of the river, for some miles below Marsh Lake, there are flats on both sides, which would, as far as surface conformation goes, serve for farms. The soil is of much better quality than any heretofore seen, as is proved by the larger and thicker growth of timber and underbrush which it supports. The soil bears less the character of detritus, and more that of alluvium, than that seen above.

As we approach the cañon the banks become higher and the bottom lands narrower, with some escarpments along the river. At the cañon the bank on the west side rises two hundred feet and upwards above the river, and the soil is light and sandy. On the east side the bank is not so high, but the soil is of the same character, and the timber small and poor, being nearly all stunted pine.

Between the cañon and Lake Labarge, as far as seen from the river, there is not much land of value. The banks are generally high, and the soil light and sandy. At the head of the lake there is an extensive flat, partly covered with timber, much larger and better than any seen above this point. Poplar eight and ten inches in diameter were not uncommon, and some spruce of fifteen and sixteen inches, and many of upwards of a foot in diameter, were also noticed. The soil, however, is light, and the vegetation, especially the grass, thin and poor.

Some miles down the lake an extensive valley joins that of the lake on the west side. This valley contains a small stream. Around this place there is some land that might be useful, as the grass and vegetation is much better than any seen so far.

On the lower end of the lake, on the west side, there is also a considerable plain which might be utilized; the soil in parts of it is good. I saw one part where the timber had been burned some time ago; here, both the soil and vegetation were good, and two or three of the plants seen are common in this part of Ontario, but they had not the vigorous appearance which the same plants have here.

Northward from the end of the lake there is a deep, wide valley, which Dr. Dawson has named "Ogilvie Valley." In this the mixed timber, poplar and spruce, is of a size which betokens a fair soil; the herbage, too, is more than usually rich for this region. This valley is extensive, and, if ever required as an aid in the sustenance of our people, will figure largely in the district's agricultural assets.

Below the lake the valley of the river is not as a rule wide, and the banks are often steep and high. There are, however, many flats of moderate extent along the river, and at its confluence with other streams. The soil of many of these is fair.

About forty miles above the mouth of the Pelly River there is an extensive flat on both sides of the Lewes. The soil here is poor and sandy, with small open timber. At Pelly River, there is a flat of considerable extent on which the ruins of Fort Selkirk stand. It is covered with a small growth of poplar and a few spruce. The soil is a gravelly loam of about eight inches in depth, the subsoil being gravel, evidently detritus. This flat extends up the river for some miles, but is all covered thickly with timber, except a small piece around the site of the fort.

On the east side of the river there is also a large plateau, but it is two or three hundred feet above the river, and the soil appears to be poor, judging from the thinness and smallness of the trees. This plateau seems to extend up the Pelly for some distance,

and down the Yukon for ten or twelve miles. As seen from the river, it reminds one of the slopes and hills around Kamloops in British Columbia, and like them, though not well suited to agriculture, might yield fair pasturage should such ever be required.

A serious objection to it, however, for that purpose, if it is not watered on the surface by ponds, is that the river is difficult of access, as the plateau on the side towards the river is bounded by a perpendicular basalt cliff, which, without artificial arrangement, would completely bar approach to the water. This cliff is more than two hundred feet high at the confluence, and becomes lower as we descend the river until, at the lower end, it is not more than sixty to eighty feet high.

Between Pelly and White Rivers there are no flats of any extent. At White River there is a flat of several thousand acres, but it is all timbered, and the surface of the soil is covered with a thick growth of moss, which prevents the frost ever leaving the ground. This has so preserved fallen timber and the foliage of the trees that much of it is lying on the surface nearly as sound as when it fell. On this account the vegetable mould on the gravel is thin and poor. The standing timber also bears witness to the coldness of the soil by its slow and generally small growth. A few trees near the bank, where the sun can heat the soil, are of fair size, but further back they are generally small.

At Stewart River there is another large flat to which the same general remarks are applicable. Thence, to the site at Fort Reliance, there are no flats of any importance. High above the river in some places there are extensive wooded slopes, which, when cleared, would be well suited for such agricultural purposes as the climate would permit.

At Fort Reliance there is a flat of probably 1,500 acres in extent; but although Messrs. Harper & McQuestion lived there for some years, it appears they never made any agricultural experiments, believing that they would be futile.

At the Forty Mile River there is a flat of about four or five hundred acres in area, on which the soil is of better quality than on many of the other places mentioned. On this Messrs. Harper & McQuestion erected their dwelling and store-houses. They gave it as their opinion that only very hardy roots would live through the many cold nights of the summer months, and that the season is so short that even if they survived the cold they would not attain a size fit for use.

The river is not generally clear of ice until between the 25th of May and the 1st of June, and heavy frosts occur early in September, and sometimes earlier.

At the boundary there are two flats of several hundred acres each, one on the west side, the other three miles above it on the east side. Both of these are covered with poplar, spruce and white birch, also some willow and small pine.

In making preparations for the foundations of our house at our winter quarters near the boundary we had to excavate in the bank of the river, and in an exposed place where the sun's rays could reach the surface without hindrance from trees or other shade we found the depth to the perpetually frozen ground to be not more than two feet. In the woods where the ground was covered with over a foot of moss the frozen ground is immediately below the moss. On this the timber is generally small, and of very slow growth, as is evident from the number of annual rings of growth. I have seen trees of only three or four inches in diameter which were upwards of one hundred and fifty years old.

It is difficult to form an estimate of the total area of agricultural land seen, but it certainly bears a very small proportion to the remainder of the country. I think ten townships, or 360 square miles, would be a very liberal estimate for all the places mentioned. This gives us 230,400 acres, or, say 1,000 farms. The available land on the affluents of the river would probably double this, or give 2,000 farms in that part of our territory, but on the most of these the returns would be meagre.

Without the discovery and development of large mineral wealth it is not likely that the slender agricultural resources of the region will ever attract attention, at least until the better parts of our territories are crowded.

In the event of such discovery some of the land might be used for the production of vegetable food for the miners; but, even in that case, with the transport facilities which

the district commands, it is very doubtful if it could compete profitably with the south and east.

#### TIMBER FOR USE IN BUILDING AND MANUFACTURING.

The amount of this class of timber in the district along the river is not at all important. There is a large extent of forest which would yield firewood, and timber for use in mines, but for the manufacture of lumber there is very little.

To give an idea of its scarceness, I may state that two of my party made a thorough search of all the timbered land around the head of Lake Bennet and down the lake for over ten miles, and in all this search only one tree was found suitable for making such plank as we required for the construction of our large boat. This tree made four planks 15 inches wide at the butt, 7 at the top, and 31 feet long.

Such other planks as we wanted had to be cut out of short logs, of which some, 10 to 14 inches in diameter and 10 to 16 feet long, could be found at long intervals. The boat required only 450 feet of plank for its construction, yet some of the logs had to be carried nearly 200 yards, and two saw-pits had to be made before that quantity was procured, and this on ground that was all thickly wooded with spruce, pine, and some balsam, the latter being generally the largest and cleanest-trunked.

These remarks apply to the timber until we reach the lower end of Marsh Lake. On the head of the river, near the lake, some trees of fair size, 12 to 14 inches in diameter, and carrying their thickness very well, could be got, but their number was small, and they were much scattered.

At the cañon the timber is small and scrubby; below it there were a few trees that would yield planks from 7 to 10 inches wide, but they have been nearly all cut by the miners, many of whom made rafts at the head of Lake Bennet, floated down to White Horse Rapids, and there abandoned them for boats which they then built.

The great bulk of the timber in the district suitable for manufacture into lumber is to be found on the islands in the river. On them the soil is warmer and richer, the sun's rays striking the surface for a much longer time, and more directly than on the banks.

At the confluence with the Pelly, on the east side of the river, there is a grove of spruce, from which some very nice lumber could be made, and on the islands below this much of the same class of timber exists. Near White and Stewart Rivers there is a good deal of nice clean timber, but it is small. It is said there is more good timber on Stewart River in proportion to the ground wooded than on the main river.

Between Stewart River and the boundary there is not so much surface covered with large trees as on many of the flats above it, the valley being generally narrower, and the sides steeper than higher up the river. This, of course, precludes the growth of timber.

To estimate the quantity of timber in the vicinity of the river in our territory would be an impossible task, having only such data as I was able to collect on my way down. I would, however, say that one-fourth of the area I have given as agricultural land would be a fair conjecture. This would give us two and a half townships, or ninety square miles, of fairly well timbered ground; but it must be borne in mind that there is not more than a square mile or so of that in any one place, and most of the timber would be small and poor compared with the timber of Manitoba and the easterly part of the North-west Territories.

At the Boundary Line I required, as has already been explained, a tree 22 inches in diameter at the ground on which to erect my transit. An exhaustive search of over three square miles of the woods there, though showing many trees of convenient size for house logs, and many for small clean planks, showed only one 18 inches in diameter at a distance of five feet above the ground.

It may be said that the country might furnish much timber, which, though not fit to be classed as merchantable, would meet many of the requirements of the only industry the country is ever likely to have, viz., mining.

## MINERALS.

Under this head I will first mention coal. A thin seam of this was found on Lewes River, about six miles above Five Finger Rapids. This seam was about three feet thick and at that stage of water was 8 or 10 feet above the river. It could be traced for several hundred yards along the bank. Dr. Dawson made an examination of this seam, and I quote from his report regarding it: "This exposure includes, within 60 feet of the base of the bluff, at least three coal beds, of which the lowest is about three feet thick. This and the other beds contain some good looking coal, of which a thickness of about a foot sometimes occurs, but the greater part of the material is so sandy and impure as to be useless. The coal has been examined by Mr. G. C. Hoffman, who describes it as a lignite coal, with the following composition:—

Hygroscopic water.....	6.03
Volatile combustible matter.....	36.92
Fixed Carbon.....	49.03
Ash.....	8.02
	<hr/>
	100.00"

At Rink Rapids thin seams of coal were seen in some shale on the east bank of the river. They were unimportant, being only an inch or so thick, but they show a probable continuation of the first mentioned bed, and a likelihood that a search would reveal an exposure of some value.

No other trace of coal was seen until Coal Creek, five miles below Forty Mile River, was reached. In the drift at the mouth of this creek I picked up specimens of coal much weathered and worn. I made inquiries of the Indians in the vicinity, but they manifested surprise at my showing it to them and burning some of it before them. They professed entire ignorance of the existence of any such stuff up the creek, and said they had never seen or heard of it, though they must, however, have seen it at Belle Isle, near which place there is some on a creek that comes in from the west. Some of this Messrs. Harper & McQuestion had brought to the post and burned there, and they had also sent some to San Francisco to be tested.

I made inquiries of the miners and of Mr. Harper, but found that none of them had any personal knowledge of the location of the seam. It appeared, however, that an old man, who had gone out of the country in the fall, had spent part of the summer prospecting on the creek, and though he found no gold he reported abundance of coal, but gave no further particulars. I had several conversations with some of the miners about this coal, and was fortunate enough to enlist the interest of one of them, Mr. James McAuley, of Victoria, B.C. He promised he would some time during the ensuing summer or fall go up the creek and try to find the seam or seams, and communicate the result to me at the first opportunity. This promise he has kept, and in a letter dated at Port Townsend, W.T., 22nd October, 1888, he says:

"I have measured those coal ledges that you desired I should examine in the British possessions. I brought some samples as far as St. Michael, but they were mislaid. Two of the ledges measure 5 feet and one 7, and there are others much larger, but I did not have time to examine them."

That is all he says with reference to the coal seams. Although it is not as definite as one would wish, enough is stated to show that there is a large quantity of coal on the creek. He does not say what distance it is up the creek, but the reason for this is plain. When I asked him to make the search he demurred, on the ground that I would publish his reply, and that some one with capital and influence might benefit by his discovery. I told him that if I published his discovery I would give him credit for it, and that he need not be definite in his location, as all that I wished to ascertain was as to the quantity of coal; and on this understanding he consented to make the search.

No other indications of coal were seen in that part of the country. Some of the drift specimens I picked up at the mouth of the creek were sent out for examination; but when they reached Ottawa they were almost reduced to powder, and I have heard nothing of any attempt at assay being made.

## METALS FOUND ON THE RIVER.

About two miles up Forty Mile River there are large exposures of a white and a gray limestone, containing many thin seams and pockets of galena. One of the seams as seen on the bank is of considerable extent, but as to its length there is no evidence, as it is all covered with drift. Two specimens were sent out and have been assayed by Mr. G. C. Hoffman, of the Geological Survey, with the following result: Specimen marked II, from Forty Mile, about two and a half miles up, contains: gold, a distinct trace; silver,  $38\frac{64}{100}$  ounces to the ton of 2,000 pounds.

Specimen marked III, from exposure on Forty Mile River, about three-quarters of a mile up, contains neither gold nor silver.

Were these seams properly surveyed the former might be found of sufficient extent and value to warrant development.

Specimen marked I, from north bank of Yukon River, opposite the mouth of Thron-Diuck River, about five miles above Fort Reliance, contains: gold, a trace; silver,  $3\frac{64}{100}$  ounces to the ton.

Mr. Harper told me he had sent out specimens of the latter ore to San Francisco some years ago for assay, and that it was pronounced good, but he could not give the value. I did not make an examination of the seam, but it appeared to be extensive. It is of bluish colour on the surface, and earthy in appearance.

Specimen marked IV, from near Station 634 of survey, or near Chandindu River, ten or twelve miles below Fort Reliance, contains: gold, a trace; silver, 0.117 ounces to the ton. Nothing was observed at this point to indicate an extensive quantity of this ore.

It must be borne in mind that these specimens were found by accident. A closer examination of the localities might reveal valuable seams. I have described the specimens found in the order of their value. Though none of them are rich, they show that through an extensive district there are at least indications of wealth. The order in which they were picked up on the river is, I, IV, and II and III together on Forty Mile River. From I to III is about forty miles in an air line. I was informed that gold and silver bearing specimens of quartz had been found on Sixty Mile Creek, but I can give no details. I was also informed that a specimen of gold-bearing quartz was picked up some years ago, high up on the side of the bank of Yukon River, opposite the mouth of White River. It was sent to San Francisco and assayed, showing the enormous value of \$20,000 to the ton. This specimen was picked up above high water mark, so that it must have been found at or near its origin, or have been transported there by a glacier, the bank being about 1,200 feet high. No further details regarding this specimen could be learned.

An extensive ledge of gold-bearing quartz is reported on the westerly side of the river, about two miles above Stewart River, but regarding it I could learn nothing definite. It may be a continuation of the same ledge which yielded the foregoing specimen.

While on Lake Bennet building our boat I found an extensive ledge of quartz and sent specimens of it out by Dr. Dawson. The assay showed that they contained only traces of gold. The ledge is 60 to 80 feet wide, and can be easily traced on the surface for three or four miles. A small creek cuts through it about a mile from the lake, and in this creek are found colours of gold.

While we were working at our boat an expert, employed by some California capitalists, came in with an old man who had made a descent of the river the previous summer. The old man and his party were storm-staid on what he called Lake Bennet, and while so delayed he found an enormous exposure of what he thought was gold-bearing rock. He took out specimens of it, and had them assayed at San Francisco. The result was so promising (\$8.80 of gold, and 92 cents of silver to the ton) that he enlisted the interest of some capitalists who sent him out with the expert to locate and test it thoroughly. The old man described the exposure so minutely and circumstantially that one could scarcely disbelieve his statement. They looked for the ledge for some days, but could find nothing resembling what he described. They then called upon me and

requested my aid. As I was making all possible haste to keep my appointment with Dr. Dawson at Pelly River I was loath to lose time in aiding the search, but, on account of the importance of the matter, and the old man's earnestness and importunity, and influenced further by a certificate of assay which he had, showing the specimens to have yielded the amounts stated (about equal to the celebrated Treadwell mine at Juneau, Alaska, the rock of which he said his mine much resembled), I at last consented.

I spent a day and night searching with him and his associates, but we failed to find anything like what he described. The old man told so many conflicting stories, and seemed to know so little of the lake, that I became convinced he was astray, and had been hoaxed by some one with a piece of the Treadwell rock. I then left them to shift for themselves. The expert took the same view of the matter, and, as he was in charge of the search, ended it there.

I afterwards, on Lake Tagish, saw a place much resembling that described. It is on the south side of the lake, and just east of its junction with the Takone arm. I was strongly of opinion that this is the place he referred to, and would have examined it to verify my impression, but the wind was too strong and the lake too rough to allow of crossing over.

These are all the indications of ore *in situ* which I saw or heard of.

The gold heretofore found and worked in this district has been all placer gold. Search was made for it occasionally by us along the lakes and river as we descended, but with the exception of the colours mentioned at the quartz ledge on Lake Bennet, none was found until after we had passed Lake Labarge, about six miles below which, at a sharp, short bend in the river we found in a bar many colours to the pan. It may be said generally that colours are found anywhere on the river between that point and the boundary, and also on the tributaries which have been prospected.

It is probable that we have not less than 1,400 miles of stream in our part of the district, upon all of which gold can be found.

About eighteen miles below the Teslinto I saw the first place that had been worked for gold. Here a hut had been erected, and there were indications that a party had wintered there. Between it and Big Salmon River, six other locations were met with. One of them named Cassiar Bar was worked in the season of 1886, by a party of four, who took out \$6,000 in thirty days. They were working there when I passed in 1887, but stated that all they could get that season was about \$10 per day, and that it was then (3rd August) about worked out. At the time of my visit they were trying the bank, but found the ground frozen at a depth of about three feet, though there was no timber or moss on it. They had recourse to fire to thaw out the ground, but found this slow work.

Two of this party subsequently went down to Forty Mile River, where I met one of them. He was a Swede, and had been gold mining for upwards of twenty-five years in California and British Columbia. He gave me his opinion on the district in these words: "I never saw a country where there was so much gold, and so evenly distributed; no place is very rich, but no place is very poor; every man can make a 'grub stake' (that is enough to feed and clothe him for a year), which is more than I can say of the other places I have been in."

In conversation with Mr. T. Boswell, who, as already stated, had prospected the Teslinto, or Newberry River, in the summer of 1887, I learned that the whole length of that river yielded fine gold, generally at the rate of \$8 to \$10 per day; but as the miners' great desideratum is coarse gold, they do not remain long in a country in which only the fine gold is found—generally no longer than is necessary to make a "grub stake," unless gold is in unusually large quantities. Mr. Boswell therefore went to the lower part of the river, having heard the reports of rich finds.

Stewart River was the first in the district on which mining to any extent was done. In 1886 there were quite a number of miners on it engaged in washing gold and they all appear to have done fairly well. Their exact number I could not ascertain.

I may say that it is generally very difficult to get any exact, or even approximately exact statement of facts or values from miners. Many of them are inveterate jokers, and take delight in hoaxing: the higher the official or social position of the person they

hoax the better they are pleased. I have several times found that after spending hours getting information from one of them it would be all contradicted by the next one I met. Another cause of difficulty in getting trustworthy information from them is that in a certain sense they consider every government official or agent their enemy, and that he is in the country to spy upon their doings, and find out their earnings, which latter the great majority of them are very much averse to have known.

So far as I could see or learn, they do not even disclose to each other their earnings for the season. I met one or two who told me that they had made a certain amount in the season, but on enquiry among the rest these statements were ridiculed and declared untrue. As a rule they are very generous and honest in their dealings with their fellow men, but a desire for correct geographical or statistical knowledge does not actuate very many of them; hence the disagreement and often contradiction in their statements.

I have heard the amount of gold taken from off Stewart River in 1885 and 1886 estimated at various amounts. One estimate was \$300,000, but this must be excessive. The highest amount I heard as representing one man's earnings was about \$6,000. This may be true, as many agree that \$30 per day, per man, was common on many of the bars of the river, and instances of as high as \$100 per day having been earned were spoken of.

The only mining done on Stewart River was on the bars in the river; the bench and bank bars were all timbered and frozen, so that to work them would entail a resort to hydraulic mining, for which there was no machinery in the country.

During the fall of 1886, three or four miners combined and got the owners of the "New Racket" steamboat to allow the use of her engines to work pumps for sluicing with. The boat was hauled up on a bar, her engines detached from the wheels, and made to drive a set of pumps manufactured on the ground, which supplied water for a set of sluicing boxes. With this crude machinery, in less than a month, the miners cleared \$1,000 each, and paid an equal amount to the owners of the boat as their share.

Alexander McDonald, who has been mentioned before, reported to me that the gold on the upper river was somewhat coarser than that on the lower, but not enough so as to be called "coarse gold." He seemed to be satisfied with the result of his season's prospecting, and intended spending the next season there.

Many of the miners who had spent 1886 on Stewart River, and 1887 on Forty Mile River, seemed to think the former the better all round mining field, as there were no such failures there as on Forty Mile, and they declared their intention to make their way back to the Stewart for the season of 1888.

Forty Mile River is the only river in the district on which, up to the fall of 1888, coarse gold had been found, and it may be said that much of it can hardly claim that distinctive title. The largest nugget found was worth about \$39. It was lost on the body of a miner who was drowned at the cañon. Several other nuggets of much less value have been found, but the number of pieces which one could call "nugget," are few.

The miners term Forty Mile a "bed-rock" creek—that is, one in the bed of which there is little or no drift, or detrital matter, the bottom of the river being bed-rock. In many places this rock has been scraped with knives by the miners, in order to gather the small amount of detritus and its accompanying gold.

Very little of the gold on this creek was found in Canadian territory, the coarsest gold being found well up the river. The river had been prospected in 1887 for upwards of one hundred miles, and gold found all the way up. The great point with a miner is to find where the gold comes from. To do this he has to reach a point on the river where there is none; then he knows he has passed the source, and will search in side valleys and gulches. The theory seems to be that the gold is stored up somewhere and dribbled out along the river.

Pieces of gold-bearing quartz had frequently been picked up along the river in the shallow drift, but none had been found in place, nor did it appear to me that much search had been made for it. Near the mouth of the river there is an extensive flat of detrital matter through which a couple of small creeks flow. This is all said to be gold-bearing, and, it was thought, would pay well for sluicing. Accordingly, a couple of

claimants had staked off claims at the mouth of the creeks, and intended to try sluicing in the season of 1888. I have not heard how the venture succeeded.

During the season of 1887 some miners prospected Pelly River, but I have no information as to their success. Dr. Dawson mentions the fact of their being there, but does not appear to have got any statistics from them.

Big and Little Salmon Rivers have also been prospected, with the usual result that more or less gold has been found everywhere.

I think it may, with confidence, be asserted that rich finds will yet be made of both coarse gold and gold-bearing quartz. It is not likely in the nature of things that such a vast extent of country should have all its fine gold deposited as sediment, brought from a distance in past ages of the world's development. If this is not the case, the matrix, from which all the gold on these streams has come, must still exist, in part at least, and will no doubt be discovered, and thus enrich this otherwise gloomy and desolate region.

There are many bank and bench bars along the river which would pay well if sluiced, but there is no convenient or economical way of getting water on them, and there is no pumping machinery as yet in the country. One bank bar of large extent, called Rogers' Bar, just below Old Man Rock, attracted attention in the spring of 1888, and some miners were thinking of getting in an engine and pumps to work it. I made an estimate of the size of engine required for their needs, and computed the probable cost of the plant laid down, but it does not appear that they made any further move.

This bar is more than fifty feet above the water. It fronts on the river for more than two miles, and is in places nearly two miles deep. It is believed that in past ages the Old Man and Old Woman rocks were connected and formed a barrier across the river, over which there was a cataract. Below this the fine gold remained, while the sand and gravel were in part carried further down. So impressed were some persons with the prospect of rich finds on this bar that they thought of bringing water across from the high level of Forty Mile River, a distance of over thirty miles; but when I went up Forty Mile River to the boundary I saw that it could not be done without the aid of force pumps, and I explained this drawback to them. This bar is said to yield four to six cents to the pan, which, with plenty of water for sluicing, would pay well, while its large extent would warrant considerable outlay. Doubtless there are many other bars as rich as this one, though not as large.

Platinum is generally found associated with gold. This is particularly the case on Forty Mile River.

As very few outside of mining communities understand anything of the nomenclature of the craft, or of the methods employed to separate the very small quantities of the precious metal from the baser material with which it is associated, a short description will not be out of place.

When a miner "strikes" a bar he "prospects" it by washing a few panfuls of the gravel or sand of which it is composed. According to the number of "colours" he finds to the pan, that is, the number of specks of gold he can see in his pan after all the dirt has been washed out, he judges of its richness. Many of them have had so much experience that they can tell in a few minutes, very nearly, how much a bar will yield per day to the man.

The process of "placer" mining is about as follows: After clearing all the coarse gravel and stone off a patch of ground, the miner lifts a little of the finer gravel or sand in his pan, which is a broad, shallow dish, made of strong sheet iron; he then puts in water enough to fill the pan, and gives it a few rapid whirls and shakes; this tends to bring the gold to the bottom on account of its greater specific gravity. The dish is then shaken and held in such a way that the gravel and sand are gradually washed out, care being taken as the process nears completion to avoid letting out the finer and heavier parts that have settled to the bottom. Finally all that is left in the pan is whatever gold may have been in the dish and some black sand which almost invariably accompanies it.

This black sand is nothing but pulverized magnetic iron ore. Should the gold thus found be fine, the contents of the pan are thrown into a barrel containing water and a



pound or two of mercury. As soon as the gold comes in contact with the mercury it combines with it and forms an amalgam. The process is continued until enough amalgam has been formed to pay for "roasting" or "firing." It is then squeezed through a buckskin bag, all the mercury that comes through the bag being put back into the barrel to serve again, and what remains in the bag is placed in a retort, if the miner has one, or, if not, on a shovel, and heated until nearly all the mercury is vaporized. The gold then remains in a lump with some mercury still held in combination with it.

This is called the "pan" or "hand" method, and is never, on account of its slowness and laboriousness, continued for any length of time when it is possible to procure a "rocker," or to make and work sluices.

A "rocker" is simply a box about three feet long and two wide, made in two parts, the top part being shallow, with a heavy sheet iron bottom, which is punched full of quarter-inch holes. The other part of the box is fitted with an inclined shelf about midway in its depth, which is six or eight inches lower at its lower end than at its upper. Over this is placed a piece of heavy woollen blanket. The whole is then mounted on two rockers, much resembling those of an ordinary cradle, and when in use they are placed on two blocks of wood so that the whole may be readily rocked. After the miner has selected his claim, he looks for the most convenient place to set up his "rocker," which must be near a good supply of water. Then he proceeds to clear away all the stones and coarse gravel, gathering the finer gravel and sand in a heap near the "rocker." The shallow box on top is filled with this, and with one hand the miner rocks it, while with the other he ladles in water. The finer matter with the gold falls through the holes on to the blanket, which checks its progress, and holds the fine particles of gold, while the sand and other matter pass over it to the bottom of the box, which is sloped so that what comes through is washed downwards and finally out of the box. Across the bottom of the box are fixed thin slats, behind which some mercury is placed to catch any particles of gold which may escape the blanket. If the gold is nuggety, the large nuggets are found in the upper box, their weight detaining them until all the lighter stuff has passed through, and the smaller ones are held by a deeper slat at the outward end of the bottom of the box. The piece of blanket is, at intervals, taken out and rinsed into a barrel; if the gold is fine, mercury is placed at the bottom of the barrel, as already mentioned.

Sluicing is always employed when possible. It requires a good supply of water with sufficient head or fall. The process is as follows: Planks are procured and formed into a box of suitable width and depth. Slats are fixed across the bottom of the box at suitable intervals, or shallow holes bored in the bottom in such order that no particle could run along the bottom in a straight line and escape without running over a hole. Several of these boxes are then set up with a considerable slope and are fitted into one another at the ends like a stove-pipe. A stream of water is now directed into the upper end of the highest box. The gravel having been collected, as in the case of the rocker, it is shovelled into the upper box and is washed downwards by the strong current of water. The gold is detained by its weight, and is held by the slats or in the holes mentioned; if it is fine, mercury is placed behind the slats or in these holes to catch it. In this way about three times as much dirt can be washed as by the rocker, and consequently three times as much gold is secured in a given time. After the boxes are done with they are burned, and the ashes washed for the gold held in the wood.\*

\*A great many of the miners spend their time in the summer prospecting and in the winter resort to a method lately adopted and which is called "burning." They make fires on the surface thus thawing the ground until the bed rock is reached, then drift and tunnel; the pay dirt is brought to the surface and heaped in a pile until spring when water can be obtained. The sluice boxes are then set up and the dirt is washed out, thus enabling the miner to work advantageously and profitably the year round. This method has been found very satisfactory in places where the pay streak is at any great depth from the surface. In this way the complaint is overcome which has been so commonly advanced by miners and others that in the Yukon several months of the year are lost in idleness. Winter usually sets in very soon after the middle of September and continues until the beginning of June and is decidedly cold. The mercury frequently falls to 60 degrees below zero, but in the interior there is so little humidity in the atmosphere that the cold is more easily endured than on the coast. In the absence of thermometers, miners, it is said, leave their mercury out all night: when they find it frozen solid in the morning they conclude that it is too cold to work and stay at home. The temperature runs to great extremes in summer as well as in the winter; it is quite a common thing for the thermometer to register 100 degrees in the shade.

Unfortunately, on Lewes and Pelly Rivers there is no way of sluicing without the aid of pumps, there being no streams with fall enough to get the necessary current in the sluice boxes.

There is very little reliable information as to the amount of gold that has been taken out of the district since its discovery and development. The following is the best estimate which I can form on the subject:

Stewart River was pretty well worked for two seasons, 1885-86, by about forty men, some of whom made at least \$5,000. Assuming that they averaged half that amount, we have \$100,000 as their earnings. Forty Mile River, the only other stream from which any large quantity has been taken, was worked in the summer of 1887 by about three hundred men, many of whom spent only a few weeks on the river, some only a few days. The statement made by those of whom I inquired was that all who worked on the river for any length of time made a "grub stake." Putting this at the lowest value I placed on it, \$450, and assuming that two hundred and fifty men made each this sum, we have \$112,500 as the amount taken out on this stream. I have heard the sum placed at \$130,000.

All the gold taken from the other streams by prospectors would not amount to more than a few thousand dollars, so that it is probable the total amount taken out of the whole district is in the vicinity of a quarter of a million dollars, of which about half was taken out in our territory.

I learned that the prevailing high water interfered very much with the success of the miners in the season of 1888, and that many of them left the country in the fall. It is probable, however, that a few will remain prospecting until something rich is found.

As Dr. Dawson has reported on the geology of the region along the Lewes, and Mr. McConnell has made an examination of the Yukon from Porcupine River, it is needless to do more than refer to their reports. I may briefly state, however, that the whole course of the river in Canada is through a mountainous country, the rocks, of which, as far as seen, are principally granite, schists, shales and some limestone, the latter at Lake Labarge. There is also some basalt at the cañon and at the confluence with Pelly River.

Just below Coal Creek a range of high mountains comes in from the south-east, and continues down the river past the boundary. These mountains are composed principally of limestone, with occasional exposure of shale and sandstone.

While going down the river with the survey I located some prominent peaks by triangulation, and determined their height. Unfortunately, I could not, owing to cloudy weather, get as many as I wished. Those located are shown on my map of the survey. I have named a few of them, as they have not, to my knowledge, been previously named.

One of them, seen from the south end of Lake Labarge on the east side, I have named Mount Dawson, after Dr. Dawson of the Geological Survey. Its altitude above the lake was taken from two points on the east side, from which its distance was respectively, 724.5 and 773 chains. The height as deduced from the observed angles of elevation of the top from each station was, respectively, 3,238 and 3,263 feet. Part of this difference is no doubt due to want of precision in the instrument used, and part to the fact that the same point may not have been sighted on from both stations. The latter height is probably the nearer to the truth. The altitude of the lake I have put at 1,959 feet, which would make the height of the mountain 5,222 feet above the sea.

Another peak near the boundary I have named Mount Morrison, after a member of my party; and another Mount Gladman after another member. These two peaks are the highest seen from the river in the vicinity of the boundary. Mount Morrison

There is continuous daylight from the middle of June until the early part of August, but in the depth of winter there is little more than three hours of partial daylight in the twenty-four. So that constant daylight for a portion of the year and almost total darkness for another portion might very well create doubts in one's mind as to what portion of the day in either case should be given to sleep. In the summer months it is possible for a miner to put in as many hours as he has the power to endure the physical strain. Constant daylight admits of several shifts of men being employed and in this way mining operations may go on continuously throughout every hour of the day.

was ascended and its height determined by aneroid barometer, the mean of the readings at starting from and returning to the river being compared with the reading at the top. The difference between the two readings at the river was about fifty feet. The height thus determined was 2,390 feet, which gives the altitude above sea 3,180 feet. Mount Gladman was apparently a little higher.

The only people doing business in the country outside of gold mining were Messrs. Harper, McQuestion & Co. They have been trading at several points on the river pretty constantly since 1873. They occupied Fort Reliance for some years, and in 1886 they established a post at Stewart River to meet the demands of the miners who were working there. They did not anticipate the rush to the country that took place in that year, and their supplies ran short, so that all were for some months on the verge of starvation. Unfortunately, too, scurvy broke out in the camp, and there was much suffering.

In 1887 they established a post at Forty Mile River, whither nearly all the miners had gone, coarse gold having been discovered there during the previous fall. During the winter of 1887-88 they did business at both these posts, Messrs. Harper & McQuestion being in charge of Forty Mile, and Mr. Mayhew at Stewart River. The latter post was kept open principally for the Indian trade, though had there been no miners there it is probable they would have abandoned it. I could not learn definitely the amount of their sales to the miners in 1887, as it is a delicate question to ask a person who is selling foreign goods in Canadian territory to reveal to a Canadian employed by the government the amount of his trade. Very likely had I asked the question I would have received a short answer, though in every other way I am under great obligation to Messrs. Harper & McQuestion for acts of kindness and attention, both sought and unsought.

A person who had a good idea of the amount of their business during the season estimated their sales at \$60,000, and from facts which came under my own observation I consider this not far from the truth.

Until the miners visited the country the trade done by this firm was confined to barter with the natives for furs. I understand that they do a sort of commission business for the Alaska Commercial Company—that is, the company supply goods at a certain advance on San Francisco prices, and deliver them at the trading post at a certain rate per ton. In payment they take whatever pelts have been collected at a certain prearranged price, varying according to the state of the fur market. I understand, however, their freight charges remain constant, and are \$30 per ton for goods paid for in furs, and \$125 per ton for goods paid for in cash, the latter being the goods imported for the use of the miners.

Their prices for goods in 1887 were not exorbitant, although there must have been a fair profit. They were: flour, \$17.50, per hundred pounds; bacon, \$40 per hundred; beans, \$18 per bushel; sugar, \$30 per hundred, and tea, \$1.25 per pound. Both of these gentlemen came into the country in the summer of 1872, Mr. Harper crossing the mountains from the Cariboo gold fields in British Columbia, and descending Liard River to the Mackenzie. He went down the latter river and up the Peel, whence he crossed to the waters of the Porcupine, which he descended to the Yukon; he then went up the latter to White River, where he wintered.

Mr. McQuestion came in at the same time by way of Peace River, trading for a short time around Lake Athabasca before he descended the Mackenzie.

The principal furs procured in the district are the silver-gray and black fox, the number of which bears a greater ratio to the number of red foxes than in any other part of the country. The red fox is very common, and a species called the blue is abundant near the coast. Marten, or sable, are also numerous, as are lynx; but otter are scarce, and beaver almost unknown.

It is probable that the value of the gray and black fox skins taken out of the country more than equals in value all the other furs. I could get no statistics concerning this trade for obvious reasons.

Game is not now as abundant as before mining began, and it is difficult, in fact impossible, to get any close to the river. The Indians have to ascend the tributary

streams ten to twenty miles to get anything worth going after. Here on the uplands vast herds of caribou\* still wander, and when the Indians encounter a herd they allow very few to escape, even though they do not require the meat. When they have plenty they are not at all provident, and consequently are often in want when game is scarce. They often kill animals which they know are so poor as to be useless for food, just for the love of slaughter.

An Indian who was with me one day saw two caribou passing and wanted me to shoot them. I explained to him that we had plenty, and that I would not destroy them uselessly, but this did not accord with his ideas. He felt displeased because I did not kill them myself or lend him my rifle for the purpose, and remarked in as good English as he could command: "I like to kill whenever I see it."

Some years ago moose were very numerous along the river, but now they are very seldom seen, except at some distance back from it. Early in the winter of 1887-88 the Indians remained around the miners' camps, and subsisted by begging until all further charity was refused. Even this for some time did not stir them, and it was not until near Christmas that sheer hunger drove them off to hunt. One party went up the Tat-on-duc some fifteen or twenty miles, and in a short time was revelling in game, especially caribou. The other party did not succeed for some time in getting anything, although a large district was searched over, but finally went up Coal Creek about twenty miles, and there killed eighteen moose in one day. They brought in two thousand pounds of the meat to the post, and sold it for ten cents per pound to the miners, with whom it was in great demand on account of the prevalence of scurvy in the camp.

A boom in mining would soon exterminate the game in the district along the river.

There are two species of caribou in the country; one, the ordinary kind, found in most parts of the North-west, and said to much resemble the reindeer; the other, called the "wood caribou," a much larger and more beautiful animal. Except that the antlers are much smaller, it appears to me to resemble the elk or wapiti.

The ordinary caribou runs in herds, often numbering hundreds. It is easily approached, and, when fired at, jumps around awhile as though undecided what to do; it then runs a short distance, but just as likely towards the hunter as from him, stops again, and so on for a number of times. At last, after many of them have been killed, the remainder start on a continuous run, and probably do not stop until they have covered twenty or thirty miles. When the Indians find a herd they surround it, gradually contracting the circle thus formed, when the animals, being too timid to escape by a sudden rush, are slaughtered wholesale.

There are four species of bear found in the district—the grizzly, brown, black, and a small kind, locally known as the "silver-tip," the latter being gray in colour, with a white throat and beard, whence its name. It is said to be fierce, and not to wait to be attacked, but to attack on sight. I had not the pleasure of seeing any, but heard many "yarns" about them, some of which, I think, were "hunters' tales." It appears, however, that miners and Indians, unless travelling in numbers, or specially well armed, give them as wide a berth as they conveniently can.

Wolves are not plentiful. A few of the common gray species only are killed, the black being very scarce.

The arctic rabbit or hare is sometimes found, but they are not numerous. There is a curious fact in connection with the ordinary hare or rabbit which I have observed but of which I have never yet seen any satisfactory explanation. Their numbers vary from a very few to myriads, in periods of seven years. For about three years one may travel for days without seeing more than a sign of them; then for two years they are numerous, and increase for two years more, until finally the country is alive with them, when they begin to disappear, and in a few months there are none to be seen. If it is an epidemic that carries them off, it is strange that their carcasses are never observed in any number.

It appears the martens are also subject to a periodical increase and decrease, and in this case a satisfactory explanation of the cause is also wanting.

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\* There were no caribou in this locality last year.

The mountain sheep (Big-horn), and mountain goats exist everywhere in the territory ; but, as they generally frequent the sides of the highest mountains, they are seldom seen from the river.

Birds are scarce. A few ravens were seen along the river, and three or four remained in the vicinity of the boundary all winter. They were generally more active and noisy on stormy days than at other times, and their hoarse croak had a dismal sound amid the roar of the elements.

A few magpies were seen near Nordenskiöld River, and a few white-headed eagles were also noticed.

During the winter, near the boundary, numbers of small birds, somewhat resembling the "chick-adee," were seen, but they were much larger and had not the same note. Of owls, not a specimen was met with anywhere. Partridges were very scarce, only half a dozen or so of the ordinary kind being noticed ; but at the head of the Tat-on-duc and Porcupine ptarmigan were abundant. Wild geese and ducks are plentiful in their season, and of ducks there are many more species than I have seen in any other part of the territory. Most of these were observed on the head of the Porcupine ; but, having no means of preserving the skins, I had to come away without specimens. A very beautiful species of loon or diver was met with on the Porcupine. It is smaller than the great northern diver, but marked much the same on the body, the difference being principally in the head and neck—the bill is sharper and finer and the head smaller ; but its chief distinguishing feature is the neck, which is covered with long, beautiful dun-coloured down for more than half its length from the head downwards. I tried to kill one so as to get the skin as a specimen, but after I had fired three times at close range with heavy shot it seemed as lively as if I had not fired at all. I then killed it with my rifle, but the bullet so tore and mangled the skin that it was useless.

With the exception of a small species, locally called the arctic trout, fish are not numerous in the district. Schwatka calls this trout the grayling, but from the descriptions and drawings of that fish which I have seen this is a different fish. It seldom exceeds ten inches in length, and has fins very large for its size, which give it, when in motion, the appearance of having wings. Its dorsal fin is very large, being fully half the length of the body, and very high. It is of a brownish gray colour on the back and sides, and lighter on the belly. It is found in large numbers in the upper part of the river, especially where the current is swift, and takes any kind of bait greedily. The flesh is somewhat soft and not very palatable. Lake trout are caught in the lakes, but as far as I saw, are not numerous nor of large size. They take a troll bait readily, and a few were caught in that way coming down the lakes, but the largest did not weigh more than six or seven pounds. Salmon came up, I was assured by several Indians, natives of the district, as far as Lake Labarge, and are never found above it, but Dr. Dawson reports their dead bodies along the river for some miles above the cañon. I mention this to show the unreliability of information received from the natives, who frequently neither understand nor are understood.

On the way down salmon were first seen twenty or twenty-five miles above Five Finger Rapids. One can easily trace their passage through the water by the slight ripple they make on the surface and, with care, they can be taken by gently placing a scoop net in their way and lifting them out when they enter it. After coming up the river two thousand miles they are poor, and would not realize much in the market. At the boundary, in the early winter months, the Indians caught some that were frozen in on small streams, and fed them to their dogs. Some of these I saw ; they were poor and spent.

I had very little opportunity to learn anything of the language, manners, customs, or religion of the natives on my way through their country, my time with them being so short, and none of the whites whom I met in the district seemed to possess any information upon which I could draw. I got a few items, but as they may or may not be facts, I shall not report them. The statements of every one I met, however, pretty well establish that by one of their laws inheritance is through the mother.

As far as possible I have obtained the numbers of the various bands along the river. Beginning at the coast the number of the Chilkoots, as stated by Commander Newell, was 138 souls, of whom about 40 were full-grown men.

As far as I could gather from G. Carmack, who lives with the Tagish Indians, and has one of them for a wife, there are of them about 112 souls all told, but many of these are almost permanently located with the Chilkoots, some of the latter having Tagish wives.

The Tagish complained bitterly to me, as well as they could, having only a few words of Chinook and English with which to convey their meaning, of the tyranny and robbery of the Chilkoots. Klohk-shun, the Chief of the Tagish, said "Chilkoot all same dog," imitating the snapping action of a dog as he said so. Those who have had any experience with Indian dogs can appreciate the comparison. These people are scattered along the river from the Teslinto up. The only market they have at present for the few furs they collect is on the coast at the head of the Inlet, and they say they are robbed of half their goods on the way there by the Chilkoots. On my way to the summit I met three or four Tagish coming in with two packs of furs, to trade. Meeting me afterwards at the summit, one of them informed me that they were met a short distance outside the village, and one of the packs was taken from them by force, and the other paid for at forced prices. Much of this talk I have no doubt was intended to create sympathy, and induce charity, as they, like many other Indians, are inveterate beggars; but I have no doubt that they are little more than slaves to the Chilkoots, and are both robbed and swindled most barefacedly.

Below Five Finger Rapids I saw two families of Indians, consisting of ten or twelve souls, very poor looking, and the most stupid I have ever met. Wanting to buy some tea and other stuff from me, they tendered in payment the tin stamps that are put by some manufacturers on plugs of tobacco. These, they signified to us, had been given to them in exchange for furs by the coast Indians. It is possible that they had got them from the Indians on the tobacco, and were trying to swindle me, but I am inclined to think not.

At Stewart River there were two Indian men, two women and two children. One of the men had picked up a few words of English from the miners and traders the winter before, and, as far as he could be, was very communicative. He informed me that there were about thirty families of Indians up the river twenty or thirty miles, "one day," as he expressed it. They were living on salmon, and had no trouble in catching all they required.

Between Stewart River and Forty Mile River three families were met with, but, as they knew neither English nor Chinook, no information as to their headquarters could be got from them. It is probable they were a part of the band located at Fort Reliance. Mr. Harper informed me that the band at the latter place numbered about twelve families, or, say, 70 souls. At Belle Isle, fifteen miles below the boundary, David's band is located. It numbers 65 to 70 souls. About one hundred miles below the boundary Charley's band has its headquarters. It numbers about twelve families, in all about 66 souls. I came more in contact with the last two bands than with any of the others, as David's band was only twelve miles from my winter quarters for some months, and many of them were frequently in the house with me for a night or two on their way to and from Forty Mile River. A missionary sent over by the Right Rev. Bishop Bompas, who is in charge of the diocese of Mackenzie River for the Church Missionary Society of England, was stationed with David's band all winter.

Some years ago, when Archdeacon McDonald, now in charge of the mission work at Fort McPherson, on Peel River, was stationed at Fort Yukon, and afterwards at Rampart House, Charley's band used to resort to those posts for their trade, and that gentleman taught them to read, and instructed them in the principles of the Christian religion. It is pleasant to be able to testify that they have profited by this instruction, and still retain a loving memory of those times. They hold every Sunday a service among themselves, reading from their books the prayers and lessons for the day, and singing in their own language to some old tune a simple hymn. They never go on a journey of any length without these books, and always read a portion before they go to

sleep. I do not pretend that these men are faultless, or that they do not need watching, but I do believe that most of them are sincere in their professions and strive to do what they have been taught is right. They are greedy and selfish in their transactions with whites, but I think much of that is because they have probably never had the sin of undue greed put forcibly before them by their pastor.

David's and Charley's bands manifested to me a much stronger sympathy for Canada than for the United States. Some of this feeling might be due to policy, for aught I know, but hitherto most of their dealings and all their education have been Canadian. The total number on the river is 482, of whom 136 are below the boundary, leaving 346 domiciled in Canada. It does not appear that any live permanently on the upper Pelly or Stewart.

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### LATER REPORTS FROM MR. OGILVIE.

CUDAHY, 4th September, 1895.

I arrived here the evening of the 30th ultimo after a tedious journey through much bad weather which delayed me fully 10 days. I leave for the boundary in a day and will commence marking it at once. With reference to the applications for land at Selkirk I may say I have not seen the applicants as yet, as they are away. It appears to me, however, from what I have learned, that the best policy is to sell the applicants the land they ask for. They have all occupied and cultivated part of it for several years, raising in their gardens such roots and vegetables as the climate will permit, on which I will report more fully later on. There is no great prospect of any town of importance ever being either at Cudahy or Forty Mile. There are many mining camps now in the country and, besides, the miners find it pays well to what they call "drift" that is quarry out the frozen gravel during the winter, pile it up, and wash it during the spring and summer. This keeps scores of men on their claims all winter, so that there is not that demand for town residences during the winter that existed formerly, and consequently town lots are at somewhat of a discount. Coarse gold and excellent prospects have been found on the Hootalinqua (Teslin) and there will likely be a rush there next spring. I will report more fully on that in future.

I propose if I can close my operations here early enough next season to make a survey and examination of the Hootalinqua rivers and basins on my way out to Juneau. I think this is desirable in view of the prospects of that region.

CUDAHY, 8th January, 1896.

I have the honour to transmit the following interim report of my operations since I came into this territory :—

I have already sent out a short report from this place being fortunate enough to catch the boat here when I came down. In that report I made some remarks on the townsites in our territory; since then I have learned nothing of importance in that connection, the most noteworthy fact being that gold bearing quartz has been found in Cone hill which stands midway in the valley of the Forty Mile River, a couple of miles above the junction with the Yukon. The quantity in sight rivals that of the Treadwell mine on the coast, and the quality is better, so much so that it is thought it will pay well to work it even under the conditions existing here. Application has been made to purchase it, and an expert is now engaged in putting in a tunnel to test the extent. Indications in sight point to the conclusion that the whole hill is composed of this metalliferous rock. If the tests corroborate this, a stamp mill will be erected next season, which will have an important bearing on the future of this country. If this venture succeeds, (as it doubtless will, for it is in the hands of parties who are able to push it) it will give permanent employment to a good many men, who with their families will form quite a community.



**J. Leduc's House—Sixty Mile Post.**





Apart from this I cannot see very much of a chance for speculation in buying or selling town sites; and my opinion is confirmed by the present condition of Forty Mile, which now contains very few people, the great majority of the miners remaining on their claims all winter, coming in only once or twice for supplies. Even in the case of the mine at Cone hill being worked, only a village would be formed around it.

Outside of all such considerations, the present applicants for Forty Mile and Cudahy town sites have either directly or indirectly occupied the present sites for years and spent thousands of dollars improving and building on them. One house erected in Forty Mile last summer is said to have cost \$10,000. It would cost between two and three thousand in Ottawa. These improvements cover so much ground that even if it were decided to lay out the town site and convey it in lots the applicants would have a claim to most of the ground they ask for.

\* \* \* \* \*

A couple of coal claims have been staked and applied for, which I will survey in the spring, and at the same time make an examination of the coal area where they are. I may anticipate this to a certain extent by saying that, a few days after I reported to you last fall, I went up Coal creek to search for this coal, to which I referred in my report of 1887 and 1888. I found it about 7 miles up the creek overlying a coarse sandstone and under drift clay and gravel.

The seam is 12 feet 6 inches thick. It seems to me to be a good quality of lignite. I have packed 30 or 40 pounds of the best specimens I found a few feet in, and will send them out to you in the spring, that a test may be made. That exposure has now been staked and applied for to the agent here. I judge from the position of these coal claims that we have quite an area of coal here. Both exposures furnish, as far as external features show, the same character of coal, and are about the same level, so that it is fair to assume they are in the same seam. I will make a search in the intervening distance to determine this when I make a survey of the claims. Coal is reported in the drift on Chandindu, about 30 miles up the river from here, which would go to show that there is another area or a continuation of this one there.

On my way down the river I saw the copper-bearing vein near Thron-Diuck Creek above Fort Reliance. It does not appear to be extensive, but there are several small veins in the vicinity, and it may be that a commercially valuable deposit may be found; about 25 miles further down I found a small vein which indicates that this copper deposit is extensive.

I found a small seam of rather poor asbestos a short distance from Cudahy, and as there is quite an extensive area of serpentine around here, asbestos may yet be found of commercial value.

Very rich placer diggings are now being worked on the creeks flowing into Sixty Mile, part of which are supposed to be in Canada. I shall be able to say definitely when I produce the line that far where they are and how much we have of them.

Except in the vicinity of Forty Mile there appears to be nothing doing in the way of quartz prospecting.

Last season good placer mines were found on the Hootalinqua—Teslin of Dawson—with coarse gold in them, and there will probably be a lot of claims worked there next season. Several miners were wintering there to commence operations early in the spring. A great deal of improvement has been introduced in the working of placer diggings, which has much increased the output. The miner instead of putting in the winter months in the towns and saloons remains on his claim all winter, cutting wood in the earlier months, with which he builds fires and thaws the frozen gravel, piling it up to be washed as soon as the flow of water in the spring will permit. In this way the work is more than doubled, but as the supply of wood is very limited except on the main river this cannot always be done.

#### TIMBER.

The timber fit for buildings and lumber is fast disappearing along the river, and in a few years there will be none left near here. There is a portable saw-mill at Fort

Ogilvie—100 miles above this—and one here, which yearly cut a good deal of lumber. Were all this utilized in Canada nothing might be said of it, but some of it goes down the river into American territory, in addition to which a good deal of wood and logs are cut on our side and floated into Alaska where it is sold. Some men make a business of this, and on this at least the department might collect dues. There is very little good timber on the American side of the line, hence the demand for our timber.

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The police have so far made a very favourable impression, and the general policy of the government in connection with this district is admired.

The merchants are well satisfied with the establishment of a court of justice, and look for the early addition of some sort of a court of record where transfers and claims can be recorded, so that the collection of debts can be undertaken with some degree of certainty. As it is now, A transfers to B, who keeps the record as long as it pays him to do so, but if he is dishonest and A is absent or dishonest too, he may destroy it, and repudiate payment of his debts. This has occurred already, and as a good deal of transferring and counter transferring is indulged in, it may occur more frequently in the future unless some court of record is created.

It is probable the boundaries of the police jurisdiction may have to be extended in the near future, for a good deal of trading is done on the head waters of the river by parties who cross the summit of the coast passes with goods from Juneau. Also the miners on the head waters and on the Hootalinqua bring in their supplies from Juneau. Now one of the traders here—Harper—has a small steamboat named the "Beaver," which he got in last season for the express purpose of reaching the upper parts of the river and its affluents with supplies, and, having paid duty on all his foreign goods, expects to be protected against smuggled goods. Should the Hootalinqua turn out as expected and promised, a police force will be required there. Harper will try hard to get up with supplies to it and Teslin Lake. I fancy he can lay down most things there as cheaply as they can be brought over the pass. It costs \$14 to \$15—sometimes more—per 100 pounds to transport from Taiya to the lakes, which makes flour cost \$16 to \$17, per hundred at the lake, while it costs or is sold here for \$8. Things here are sold so low now that were I ever coming in from the Pacific again I would bring nothing in quantity but bacon, on which I might save a dollar or two a hundred, it being sold here for \$30 to \$35 per hundred.

\* \* \* \* \*

I have produced the boundary line about five miles north of where it crosses the Yukon River, which is as far as I thought needful at present. I have also produced it about 7 miles south, and about the end of February will resume work and run it as far as Sixty Mile River. In connection with this I have occupied six photograph stations and developed all the plates exposed which have turned out satisfactorily. I have made a cross section measurement of the Yukon River where the boundary crosses it.

\* \* \* \* \*

In the vicinity of the river I have opened out a wide line in the woods which will remain visible for several years, but I erected nothing permanent on it.

\* \* \* \* \*

Up to date our lowest temperature has been 63° below zero. The winter has been unusually windy. Coming up here we had to face a strong wind when 52° below zero, and frozen faces and noses were the rule of the day.

No mail from outside since September.

CUDAHY, 10th June, 1896.

I submit the following interim report of my operations in the Yukon District up to date.

\* \* \* \* \*

After my return there was some fine clear weather in January, but it was exceedingly cold, more than 60° below zero, one night 68°·5; and as I had both my ears pretty badly frozen and could not go out in such cold without having them covered, so that I could not hear the chronometer beat, I could not observe until the end of the month when we had two fine nights—29th and 30th—mild enough for me to work.

\*   \*   \*   \*   \*   \*   \*

Having reduced all my observations, and the days having attained a reasonable length, I went into camp on the line on the 20th February, resuming work on the 22nd. But as the hill tops are all bare and from two to three thousand feet above the river we lost many days through the fierce winds.

Our progress was necessarily slow for this reason and also from the fact that I photographed from several stations, which took some time. As there were no important creeks between the Yukon and Forty Mile Rivers I did not cut the line out continuously, but left it so that any one wishing to can place himself on or very near to the line. The distance from the Yukon to Forty Mile River is a little over twenty-five miles. In the valleys along the line the timber was thick, with much underbrush, but very little of it is of much value. Curiously enough the line kept generally in the valleys or on the sides of them, and very little of it was in the open. Going from point to point we had to follow as much as possible the hill tops and ridges. I reached Forty Mile River with this survey on the 13th March. From this point southwards there are many streams cut by the line, all of which are more or less gold-bearing and all have been more or less prospected. This necessitated my cutting the line out continuously from Forty Mile River onwards, which increased our work very much. The valleys traversed are generally upwards of 1,000 feet deep and often very steep, so that the work was exceedingly laborious.

Transporting our outfit from camp to camp was often a very hard task as the hills were so steep everything had to be packed up them, which in the deep soft snow was anything but easy. I reached a point within two miles of Sixty Mile River on the 14th April, and as I had passed all the creeks of any note, and many of them were already running water and our way lay down them, I thought it well to quit work on the line and return to Forty Mile and Cudahy, and attend to the local surveys there. The weather was fine and warm, and so much water ran in the creeks by which we had to return that we could only travel a few hours in the early morning and forenoon. Had the season been more favourable I would have visited Glacier and Miller Creeks which were generally supposed to be in Alaska, but are found to run in Canada for some distance. They are the two richest creeks yet found on the Yukon and are both tributaries of Sixty Mile River. Both creeks are fully located and worked, each claim being 500 feet along the creek and the width of the valley or creek bed. There are nearly 100 claims, all of which pay well. One on Miller Creek I understand will yield 75 to 80 thousand dollars this season, and the owner will net, it is said, between 40 and 50 thousand dollars. He took out, it is reported, nearly half that sum last year off the same claim, and expects to do equally well next year. This is much the richest claim yet found, but all on those creeks do well. There are many other creeks in this vicinity yet to be prospected and some will, I have no doubt, pay well. Gold is found all along the valley of Sixty Mile River, and under more favourable conditions, both mercantile and climatic, it would yield good results to large enterprises. The mercantile conditions will improve; the climate is a serious difficulty but will be surmounted in time I believe. Along the last 10 or 12 miles of the line I ran, the mountains consist principally of quartz and schists, which no doubt originally held the gold found in the valleys and doubtless hold some yet. Several men have taken to quartz prospecting, and from indications which I will dwell on later I believe we are on the eve of some magnificent discoveries.

The miners on all the creeks referred to have quietly accepted my line as the boundary *pro tem*, and as far as I can learn at present the general feeling is satisfaction that one can now know where he is. Even if the line is not final, no one doubts its being very near the final position. As far as run it is marked by cairns of stones wherever it was possible to procure them with reasonable time and labour, and is cut through the woods and blazed so that no one who wants to find it can mistake it. Another source of satisfaction to all is that they now know distances and directions. Many miners remark to me "we now know how we are going, we can see where south is." In this high latitude in the summer months it is impossible to tell when the sun is near the meridian because its change in altitude is so little for 8 or 9 hours, con-

sequently any point between east and west was called somewhere near south. This helps to explain much of the variance in the direction of points as given by miners and others who have no compass or are unacquainted with the use of one and the application of the declination.

On my arrival at Cudahy I rented two cabins from the N. A. T. & T. Co., to house my men and self as I would be around here probably until I started up the river. I did this because there are no convenient camping places in the vicinity, and in the spring all the flats are like lakes along the river until well into the month of June.

After a couple of days rest for the party, who had worked very hard, and after I had developed all my photographs, I began to attend to the local surveys, first surveying the coal claims on Coal Creek and making a chain traverse survey of the creek from the claims down to the Yukon.

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I next made a survey of the Cone hill quartz mining claim and a chain traverse survey of Forty Mile River from the claim down to the Yukon. I then went to work on the Forty Mile town site and Cudahy town site. The last I was asked to block out, which I have done. The manager, Mr. C. H. Hamilton, objected to streets 66 feet wide on such a small plot of ground (there is only about 50 acres). I read him my instructions and wrote him an official letter on the subject, but he insisted on streets only 50 feet wide and assumed all responsibility, so I did as he desired. I made him a plot of the work done on the ground, and he understands that he will have to pay the department for the service rendered in blocking as well as the original survey, and wishes a plan of it, which of course can only be prepared when I go out.

I made a complete survey of Forty Mile, locating and taking the dimensions of every house in it, and it is the worst jumble I ever saw. I had to do this though it entailed a great deal of work, for there were so many claim holders, and there appeared to be a general distrust in the vicinity; every man wants himself on record in evidence as to his claim. I have taken some, but I have several days work yet. I made a survey of the island for the Anglican mission, and of another island for a man named Gibson. This is in the delta of Forty Mile Creek, and he intends to make a market garden for the growth of such vegetables as the country will produce. In my final report I will deal as fully as my experience here will permit on that phase of the country's character. Many here have small gardens and are fairly successful with ordinary vegetables. I have advised many to correspond with the experimental farm at Ottawa, with a view to learning the best sort of vegetables for growth in this climate. There is an application in, and the purchase money and cost of survey paid, for 80 acres just west of Cudahy town site, which I will survey in a few days. There is also an application in for 40 acres containing a hay swamp on the east side of the river, about 2 miles below here, which I will survey before starting out. There are many other applications in, but I shall not have time to attend to them, nor have the parties asked for a survey. I think these applications are simply intended to hold the ground until the future of this region is forecasted; it certainly looks promising now. I would respectfully call the attention of the department to the fact that the services of a surveyor are urgently needed in here and will be for some years to come, and I would suggest that one be appointed to look after and take charge of all the land interests in this district. He will find plenty to do, and any work outside of departmental which he might be asked to do (and there is much of it, and will be more in the way of engineering) would help materially to pay his salary which would of course in here have to be liberal.

I have had several applications for engineering surveys, and I have told the parties I can only make these as an officer of the department, with whom they will have to settle on the basis of the time it took and the cost per day of the party and myself, should I undertake any of it, which is more than doubtful. Any surveyor so appointed will require experience in the taking of evidence and will need to be patient and attentive, for it is extremely difficult to make some of the people here understand what they want to know.

Some sort of registration office is now and will be still more needed in the country.

Another inconvenience is the want of a trade medium; there is very little coin, nearly all business being transacted in gold dust, which passes current at \$17 per ounce troy\*, but, as most of it will not assay that, there is some hardship to those taking it out, though there may be no actual loss. If enough money were sent in to pay the North-west mounted police for some time it would help for a period at least, and would emphasize the existence of Canada. What coin and bills are here are largely American.

Another important question is the treatment of the liquor business, which cannot be ignored much longer; there are several saloons in Forty Mile and one in Cudahy, yet there is no law recognizing them nor regulating them in any way. It would be almost impossible and very unpopular were any attempt made to close them. Liquor could not be kept out of the country if the whole North-west mounted police were scattered around the river.

Another subject which I have mentioned before is that of the timber. Large quantities of timber are being and have been cut in our territory and floated down the river to American territory, where it is used, and Canada derives no benefit. Were it used to develop our country it would matter less; in fact, I would encourage such use; but to see the best of our timber taken out without any sort of benefit to the country is, I think, worthy of some sort of attention. There is very little useful timber in the country, and much of what does exist is cut into fuel, while more of it goes beyond the boundary. In the near future we shall feel the want of it. I have spoken to the agent about it, but he has no authority to act, and, if he had, is disinclined to run up and down the river looking after it unless he has a steamer.

Some sort of court for the collection of debts is required here now, and whether or not the agent could act in that capacity is a question to be decided.

The merchants here who pay duty are naturally dissatisfied at the smuggling done on the upper river and ask for some sort of protection. It might be advisable to have a squad of police and an officer somewhere on the lake to look after that. I am thoroughly convinced that a road from the coast to some point on the head waters of the river, preferably by the Taku if at all practicable, would convert all our part of the river into a hive of industry. It may be said there is no competition, and any way in the present conditions of trade things cannot be sold very much cheaper at a fair profit. Once let a railroad get from some point on the coast to some point on the river so that we can have quick, cheap, and certain entrance and exit, and the whole Yukon basin will be worked. At present the long haul makes the expense of mining machinery practically prohibitive, for the cost of transport is often more than the first cost of the machine.

Assays of the Cone hill quartz are very satisfactory, and the quantity good for generations of work; were it on the coast the Treadwell mine would be diminutive beside it. Five tons of rock are being sent out from it for a mill test, and should they prove as satisfactory as the test of a ton sent out last year, I understand the parties owning it will proceed to develop it. If it starts and proves reasonably successful there are scores of other places in the country that may yield as well. An expert here who prospects for the N. A. T. and T. Co., found a ledge last spring on the Chandind River of Schwatka (known as Twelve-Mile Creek here) and located two full claims on it. He told me the assay he made of my specimens of it was much more satisfactory than that of Cone hill, and this ledge, he claims, is where a commencement should be made in quartz milling in this country and there would be no fear of the result. He appears to be pretty well versed in mining lore, is a practical assayer—that is his profession—and he says he never saw or read of anything like it for extent in the world. He informed me there were extensive deposits of coal about 20 miles up the creek and this ledge was about 4 miles up. He has no doubt but that the copper around Fort

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\* The net value of the gold received by the department was found to be only \$16.50 per ounce, 9 cents of which were silver. Deducting freight, insurance, mint charges and bank commission, the amount realized is reduced to \$15.77. Inspector Constantine, N.W.M.P., quotes assays by the United States office at Helena, Mont., of gold from eight creeks, ranging from \$14.46 for the Upper Lewes to \$17.33 for Davis Creek. The average is \$16.12.

Reliance will, with better facilities, yet be a valuable feature of the country. He showed me a lump of native copper some Indians said they found on the head of White River but could not or would not specify where. Speaking of White River reminds me that it and Sixty Mile are very close together in the vicinity of the boundary. I was told it was only a short walk from the creeks of one to the creeks of the other, but how far from stream to stream is uncertain.

This expert is an American who has spent many years of his life in the best mining districts in the United States, and he assures me this country promises better than any he ever saw before, and as an evidence of his satisfaction with it he is going to spend the rest of his life here.

Great anxiety is felt here about a mail route and regular mail. Last winter 3 mails left the coast, one by the Taku route, one by the White pass, and one via Taiya; the first two got here in good time, the last, (ours by the way) did not, nor is it likely to arrive for some time—may be never. The man in charge was badly frozen on the summit and had to turn back leaving the mail behind him and it is now probably buried in fathoms of snow. An Indian brought the mail in by the Taku and took the Slocan branch of it to Atlin lake. From what I learned of this route while up there it may be found to afford an easier way than by Teslin Lake but it has the disadvantage of landing on the head of the Lewes instead of the Hootalinqua or Teslin and so takes in the cañon and White Horse Rapids.

Last winter many of the residents and miners here talked to me about the mails and what the government intended in that direction; of course I could tell them nothing. They made their views known by getting up a petition to the Minister of the Interior.

The Alaska Commercial Company are putting a new and powerful steamer on the river, which will make four, the "Arctic", "Alice", and "Emma", large, and the "Bedon", small. There is some talk of the N. A. T. & T. Co., putting on a sister boat to the "Portus B. Weare." All are stern wheel boats. \*

From my camera stations on the boundary I saw many high mountains, some of them not less than 8,000 feet, and some I believe 10,000. Some of the prominent ones I have named after the pioneers of the country, notably one Mount Campbell after the late Mr. Robert Campbell of the H. B. Co., who established Fort Selkirk. It is about 60 miles due east of here and is a noteworthy peak in that it stands on top of an extensive well defined range, rising like a lofty pillar about 1,000 feet above the ridge. It is, as far as seen, the most remarkable peak in the country. I have not made any computations yet, but I do not think its summit is much if any less than 10,000 feet above the sea. No one noticed it before for the reason that it is only about 600 feet wide, is always black, and very distant from points where it can be seen around here.

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CUDAHY, June 25th, 1896.

Horses could be laid down here for, I would say, about \$250 per head, and the same animals ought to last the whole survey. Horses that have been in use here, packing to the mines in the summer and hauling wood in the winter for several years, are still serviceable, notwithstanding that they live only on the coarse grasses of the country. They pack 200 pounds apiece from Forty Mile River at the mouth of Moore Creek to the mines on Miller Creek (about 17½ or 18 miles) and climb some very steep long hills on the way, taking 2 days with loads and one day without; all they get to eat is what they find.

\* \* \* \* \*

My last report told you of the agent here going to Miller and Glacier Creeks and collecting fees and making entries; as he did not go west of those creeks no complications will arise for as you will see by my sketch map they are within Canada. I may say here that one claim on Miller Creek turned out about \$70,000 last winter, and several others have done very well too. So far nearly all the miners have passed here.

\* The estimates submitted at the last session of Parliament contain an item of \$5,000 for the purchase of a steamer for the use of the Mounted Police in the Yukon District.

going to Circle City (about 200 miles down) and I have no doubt many of them will keep on going.

About 100 miners are reported on the Hootalinqua this summer. We shall probably soon have to extend law and order there.

Many here make gardens, using any seed they can get, and some are going to try grasses for fodder. I would suggest the director of the central experimental farm be asked to send in seeds of the kinds of ordinary vegetables and grasses best suited to such a climate as this, to be distributed by the agent here to those who will make a proper use of them, or for sale at cost. I am quite sure it would be of much service, and if some hints on the proper care of plants were sent in it would be more so, as most of the people in here know practically nothing of gardening or farming. Besides, it would improve the feeling among the people here towards our country and institutions and would cost the country practically nothing.

CUDAHY, August 18th, 1896.

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It is now certain that coal extends along the valley of the Yukon from Coal Creek for 10 or 12 miles down, and from Coal Creek up to Twelve Mile Creek, which flows into the Yukon about 30 miles above here. The latter stretch is cut off from the river by several miles of hills, as it is about 6 miles direct from the river at Coal Creek and about 18 on Twelve Mile Creek. This is the stream named Chandindu by Schwatka. There is a seam on it about 6 feet thick, as reported by an expert who went in search of it. I found drift coal on the south branch of Coal Creek.

On the Cornell claim on Cliff Creek the seam is 5 feet 4 inches thick. I have sent specimens of it out. I found it necessary to refer to the different creeks so had to name them "Shell Creek," because I found a stone with a shell impression at its mouth; "Cliff creek," because it enters the river at the foot of a high cliff; and "Flat Creek," because it enters the river in a large flat.

Glacier Creek is turning out very well, and several good creeks have been discovered up Forty Mile in Alaska.

CUDAHY, 6th September, 1896.

I have been in hourly expectation of the Canadian mail for some days now, but it has not arrived yet. The A. C. Co.'s Steamer "Alice" came up on the 4th instant, but brought no news for me, so that I am completely in the dark as to my movements yet, and if I am to go out it is time I was on the way. I do not wish to remain here another winter unless it is absolutely necessary; more especially with my party and all its expenses. In case I go out, I will try to accompany Mr. J. Dalton over his trail from the head of Chilkat Inlet to Selkirk on the Yukon. He has made several trips over that route with horses and packs and speaks very highly of it. I will make a rough survey of it and take some photographs along the route.

I have taken copious notes of it from him, but would like to see it for myself.

I am very much pleased to be able to inform you that a most important discovery of gold has been made on a creek called Bonanza Creek, an affluent of the river known here as the Klondike.\* It is marked on the maps extant as Deer River and joins the Yukon a few miles above the site of Fort Reliance.

The discovery was made by G. W. Cormack, who worked with me in 1887 on the coast range. The indications are that it is very rich, indeed the richest yet found, and as far as work has been carried on it realizes expectations. It is only two weeks since it was known, and already about 200 claims have been staked on it and the creek is not yet exhausted: it and its branches are considered good for 300 or 400 claims. Besides there are two other creeks above it which it is confidently expected will yield good pay, and if they do so we have from 800 to 1,000 claims on this river which will require

\* The correct name is Thron Diuck.



over 2,000 men for their proper working. Between Thron-Diuck River and Stewart River a large creek called Indian Creek flows into the Yukon and rich prospects have been found on it, and no doubt it is in the gold-bearing country between Thron-Diuck and Stewart Rivers, which is considered by all the old miners the best and most extensive gold country yet found. Scores of them would prospect it but for the fact that they cannot get provisions up there and it is too far to boat them up from here in small boats.

This new find will necessitate an upward step on the Yukon, and help the Stewart River region.

News has just arrived from Bonanza Creek that three men worked out \$75 in four hours the other day, and a \$12 nugget has been found, which assures the character of the ground, namely, coarse gold and plenty of it, as three times this can be done with sluice boxes. You can fancy the excitement here. It is claimed that from \$100 to \$500 per day can be made off the ground that has been prospected so far. As we have about 100 claims on Glacier and Miller Creeks, with three or four hundred in this vicinity, next year it is imperative that a man be sent in here to look after these claims and all land matters, and it is almost imperative that the agent be a surveyor. Already on Bonanza Creek they are disputing about the size of claims.

I would have gone up and laid out the claims properly, but it would take me ten or twelve days to do so, and meantime my presence might be more urgently required elsewhere.

Another important matter is the appointment of some sort of legal machinery here. Before the police came miners' meetings administered justice, collected debts, etc., etc.; now the magistrates here are expected to do all that, and when it is found that they do not it causes much dissatisfaction, and there are several cases of real hardship where parties will not pay their just debts though able to do so. If a miners' meeting were held and judgment given against the delinquent it would do no good for he would and does resist payment, and were force resorted to he would appeal to the police for protection. A continuation of this state of affairs is most undesirable in the interests of our country, for we have a reputation as a justice-administering, law-abiding people to maintain, and I would urgently press this matter on the authorities.

From the indications I have mentioned it will be seen that this corner of the North-west is not going to be the least important part of it, more especially when we consider the fact that gold-bearing quartz has been found in it at numerous places and much will no doubt be worked. It is apparent that the revenue and business of the country will more than offset the expense of administration.

I cannot here enter into the reasons for it, but I unhesitatingly make the assertion that this corner of our territory from the coast strip down and from the 141st meridian eastward will be found to be a fairly rich and very extensive mining region.

As I have already pretty fully reported on coal, I will only add that it is reported in abundance only 8 miles up the Chandindu River, where a seam over 6 feet thick has been found of the same quality as that already described.

CUDAHY, November 6th, 1896.

Your official letter informing me that negotiations for a joint survey of the 141st meridian had so far failed, and that I had better return to Ottawa for the winter, reached me here on the 11th September. As the Alaska Commercial Company's steamer "Arctic" was then hourly expected up the river on her way to Selkirk, I thought it best to wait and go up on her to that point. Day after day passed without any sign of her; wearied of waiting, and hopeless of her arrival at all this year, I determined to start out on the 27th September, a late date but with fair conditions feasible. On the 25th a tremendous storm of snow set in which so chilled the river that in a few days after it was choked with ice which precluded all idea of getting up the river, and it was equally hopeless down the river.

Three parties have announced their intention of starting for the outside world about the 1st prox., and I write this contemplating its transmission by one or other of

these parties. For myself to think of going out in the winter is, I think, unwise, for the following reasons:—Dogs, the only means of transport, are scarce and dear, ranging from \$30 or \$40 to \$125 apiece. Dog food, like all other food, is scarce, by reason of the poor salmon run in the river last season—practically none were caught near here—and the result is the dog owners here have to use bacon for food, which, at 25 to 40 cts. per pound, is expensive.

I would require a team of eight dogs to take my outfit and my man Fawcett with our provisions and the dogs' food as far as Taiya. There the dogs would have to be abandoned or killed, as they are worthless on the coast, except to parties coming in here early in the season. Starting from here say December 1st, it would be February before I reached Ottawa, and during 35 or 40 days of this time we would be exposed to much cold and hardship and some hazard from storms.

The journey has been made, and I would not hesitate to undertake it were things more reasonable here and dog food plentiful, but it would take at least \$1,000 to equip me with transport and outfit, which sum, I think, I can expend more in the interests of the country by remaining here and making a survey of the Klondak of the miners—a mispronunciation of the Indian word or words "Thron-dak" or "diuck," which means plenty of fish, from the fact that it is a famous salmon stream. It is marked Tondak on our maps. It joins the Yukon from the east, a few miles above the site of Fort Reliance, about 50 miles above here. As I have already intimated, rich placer mines of gold were discovered on the branches of this stream. The discovery, I believe, was due to the reports of Indians. A white man named George W. Cormack, who worked with me in 1887, was the first to take advantage of the rumours and locate a claim on the first branch, which was named by the miners Bonanza Creek. Cormack located late in August, but had to cut some logs for the mill here to get a few pounds of provisions to enable him to begin work on his claim. The fishing at Thron-Diuck having totally failed him, he returned with a few weeks' provisions for himself, his wife and brother-in-law (Indians) and another Indian in the last days of August, and immediately set about working his claim. As he was very short of appliances he could only put together a rather defective apparatus to wash the gravel with. The gravel itself he had to carry in a box on his back from 30 to 100 feet; notwithstanding this the three men working very irregularly washed out \$1,200 in eight days, and Cormack asserts with reason that had he had proper facilities it could have been done in two days, besides having several hundred dollars more gold which was lost in the tailings through defective apparatus.

On the same creek two men rocked out \$75 in about four hours, and it is asserted that two men in the same creek took out \$4,000 in two days with only two lengths of sluice boxes. This last is doubted, but Mr. Leduc assures me he weighed that much gold for them, but is not positive where they got it. They were new comers and had not done much in the country, so the probabilities are they got it on Bonanza Creek. A branch of Bonanza named Eldorado has prospected magnificently, and another branch named Tilly Creek has prospected well: in all there are some four or five branches to Bonanza which have given good prospects. There are about 170 claims staked on the main creek, and the branches are good for about as many more, aggregating say 350 claims, which will require over 1,000 men to work properly.

A few miles farther up Bear Creek enters Thron-Diuck, and it has been prospected and located on. Compared with Bonanza it is small, and will not afford more than 20 or 30 claims, it is said. About 12 miles above the mouth Gold-bottom Creek joins Thron-Diuck, and on it and a branch named Hunker Creek (after the discoverer) very rich ground has been found. One man showed me \$22.75 he took out in a few hours on Hunker Creek with a gold pan, prospecting his claim on the surface, taking a handful here and there as fancy suggested. On Gold-bottom Creek and branches there will probably be 200 or 300 claims. The Indians have reported another creek much farther up, which they call "Too much gold creek," on which the gold is so plentiful that, as the miners say in joke, "you have to mix gravel with it to sluice it." Up to date nothing definite has been heard from this creek.

From all this we may, I think, infer that we have here a district which will give 1,000 claims of 500 feet in length each. Now, 1,000 such claims will require at least 3,000 men to work them properly, and as wages for working in the mines are from 8 to 10 dollars per day without board, we have every reason to assume that this part of our territory will in a year or two contain 10,000 souls at least. For the news has gone out to the coast and an unprecedented influx is expected next spring.\* And this is not all, for a large creek called Indian Creek joins the Yukon about midway between Thron-Diuck and Stewart Rivers, and all along this creek good pay has been found. All that has stood in the way of working it heretofore has been the scarcity of provisions and the difficulty of getting them up there even when here. Indian Creek is quite a large stream and it is probable it will yield five or six hundred claims. Further south yet lies the head of several branches of Stewart River on which some prospecting has been done this summer and good indications found, but the want of provisions prevented development. Now gold has been found in several of the streams joining Pelly River, and also all along the Hootalinqua. In the line of these finds farther south is the Cassiar gold field in British Columbia; so the presumption is that we have in our territory along the easterly water-shed of the Yukon a gold-bearing belt of indefinite width, and upwards of 300 miles long, exclusive of the British Columbia part of it. On the westerly side of the Yukon prospecting has been done on a creek a short distance above Selkirk with a fair amount of success, and on a large creek some 30 or 40 miles below Selkirk fair prospects have been found; but, as before remarked, the difficulty of getting supplies here prevents any extensive or extended prospecting.

Dalton informed me he had found good prospects on a small creek nearly midway between the coast range and Selkirk in his route. His man showed me some coarse gold, about a dollar's worth, he found on the head of a branch of the Altsek River near the head of Chilkat Inlet, which is inside the summit of the coast range and of course in our territory. From this you will gather that we have a very large area all more or less gold bearing and which will all yet be worked.

Good quartz has been found in places just across the line on Davis Creek, but of what extent is unknown as it is in the bed of the creek and covered with gravel. Good quartz is also reported on the hills around Bonanza Creek, but of this I will be able to speak more fully after my proposed survey. It is pretty certain from information I have got from prospectors that all or nearly all of the northerly branch of White River is on our side of the line, and copper is found on it, but more abundantly on the southerly branch of which a great portion is in our territory also, so it is probable we have that metal too. I have seen here several lumps of copper brought by the natives from White River, but just from what part is uncertain. I have also seen a specimen of silver ore said to have been picked up in a creek flowing into Lake Bennet, about 14 miles down it, on the east side.

I think this is enough to show that we may look forward with confidence to a fairly bright future for this part of our territory.

When it was fairly established that Bonanza Creek was rich in gold, which took a few days, for Thron-Diuck had been prospected several times with no encouraging result, there was a great rush from all over the country adjacent to Forty Mile. The town was almost deserted; men who had been in a chronic state of drunkenness for weeks were pitched into boats as ballast and taken up to stake themselves a claim, and claims were staked by men for their friends who were not in the country at the time. All this gave rise to such conflict and confusion, there being no one present to take charge of matters, the agent being unable to go up and attend to the thing, and myself not yet knowing what to do, that the miners held a meeting, and appointed one of themselves to measure off and stake the claims, and record the owners' names in connection therewith, for which he got a fee of \$2, it being of course understood that each claim holder would have to record his claim with the Dominion agent and pay his fee of \$15.

\* A feature of this year's immigration is that it includes many women and children. The correspondent of a western paper, writing from the Chilkoot pass at the beginning of last month, says: "to go along the trail, one would think the people were bound for a farming country, there are horses, ploughs, wheelbarrows, three mowing machines, coops of chickens, etc."

At the same meeting they discussed our law on mining, and discovered, as they thought, that it was very defective. They appointed a committee to wait on the agent and ask him to ratify their course in appointing the surveyor and recorder to act *pro tem* on the creek and to forward their views on the law to the department at Ottawa. Now, it appears to me that a good deal of fault of the law as they found it lay in the fact that they did not read it all in its proper connection; and because the printed law did not start out from a given point and detail consecutively just what was to be done under every possible contingency that might arise under that heading they thought it defective. I believe this to be the case because I have never had any difficulty in explaining any case that has been submitted to me for an opinion, and there have been a good many.

The miners as a rule are dissatisfied with the claims laid out for them by their own surveyor appointed as I have already intimated, and many of them are claiming for a remeasurement now that they know that I am going to make a survey of the creeks. In fact many of them thought that a survey of the creeks necessarily meant a survey and adjustment of the claims, and it took me some time to correct that impression. I made them understand that as the claims had been laid out by their own act and had been approved of by the agent I could not interfere without the consent and approval of all the original parties to the act, and they would have to meet and discuss the question and determine whether they would have them adjusted or not. If they decide to have it done I made them understand they would have to assist me at work as I passed along. If they do not require it I will take the necessary steps to enable me to plot very closely where every claim is. I may make a good deal of the survey by photography as I have about 10 dozen good plates yet. In any case I will occupy several photo stations to enable me to give some idea of the mountain ranges around—if any—and supplement my views from the boundary last winter. As soon as this work is done all my men will take their discharge, Adam Fawcett going into the service of the Alaska Commercial Company, and all the rest mining.

If you want any further surveys made in here men will have to be sent in to do it, for men cannot be had here for less than from \$5 to \$10 per day. Any man sent in for survey purposes will require to bring a good canoe with him, say 19 feet long and 44 inches wide, and 18 to 20 deep. Such a canoe will bring in 5 or 6 men and their stock of provisions for the trip. By the time they would arrive here provisions will be plentiful, for the boats will then be up from Circle City where two of them are probably wintering. A party crossing the summit early in June would just about find the lakes open for the run down. You might warn any such party that they had better run no risk at the Cañon, White Horse and Five Fingers. The Cañon is not dangerous, but there is a good portage past it. The rapids between it and the White Horse are rough in high water but with care are safe. A great many large boats run the White Horse but most of them take more or less water; many fill altogether and the owners are often drowned; in any case they lose all their effects if they do escape. A careful estimate of those drowned in 1895 places the number at 13, a large percentage I think of those who tried it. The Five Fingers are at some stages of the water uncertain. Last time I came down I found it very nice on the left side—no danger at all, while boats passing the right side took in water. In every case the party in charge will do well to carefully examine beforehand all the points named. Should you deem it advisable for myself to return early in the summer I will have to make my way around by the mouth as I will have no men to help me up stream and no one will be ascending the river until near September, and indeed very few do at all now. Any party coming in would reasonably be expected in before I started down, and I could confer with them on the work to be done should you deem it advisable to do so.

In the course of a year I believe coal will supersede wood for fuel, which will relieve the demand as far as the towns and villages are concerned; but mining interests will require a lot of fuel where coal cannot be taken.

The traffic in liquor will have to be taken hold of and regulated at once; it is here now and cannot be kept out by any reasonably practical means. The majority—the great majority of miners—will have it, and all the more will their predilection be if it is attempted to stop the entry of it.

In my opinion it is imperative that this business be brought under control at once, or it may develop phases that will be at least annoying in the near future.

I have in previous reports intimated that some sort of legal machinery is now absolutely necessary for the trial of cases of contract, collection of debts and generally the judicial interests of the country. There are several cases of hardship now for the want of a proper court.

If some sort of court to satisfy the necessities of the people in business here is not at once established serious inconvenience will result. The officer appointed will require to be a hale vigorous person, for it is probable he will have to make journeys of considerable length across unoccupied country, in the discharge of his duty.

There have been several applications for land in the vicinity of the mouth of the Thron-Diuck, and Inspector Constantine has selected a reserve for government purposes at the confluence of that stream with the Yukon 40 acres in extent.

A court or office of record in real estate transactions will require to be opened here at once. A recorder was appointed in Forty Mile and a plot made in 1894. In anticipation of my going out this fall I got a meeting held of the property owners and had them hand the records over to me for the information of the department. They are in my possession yet, and I will take them out with me when I go. They are rather crude in form and require an initiate to understand them. I act as recorder *pro tem*.

\* \* \* \* \*

Before closing I may say that every report that comes in from Bonanza Creek is more encouraging than the last. Prospecting has only begun, and up to date of mailing, November 22nd, very rich prospects have been found on the few claims prospected on: from one dollar to the pan of dirt up to twelve dollars are reported and no bed rock found yet. This means from \$1,000 to \$12,000 per day per man sluicing.

The excitement is intense but at this season of the year it is natural very local.

I expect a mail will be starting from here in January and I will try and send out a short report by it embracing events up to date.

CUDAHY, 9th December, 1896.

A mail left here for the outside on the 27th ultimo by which I sent you an interim report, which will probably reach you in January. From it you will learn how I came to be caught in the country and why I have not attempted to get out in the winter. As you are as likely to get that report as you are this one, I refrain from repeating more here than to say that should it be necessary for me to go out before summer I will try and get out by dog team, starting in the last of February or early in March when the days are long and the weather mild, getting out say early in May.

Since my last the prospects on Bonanza Creek and tributaries are increasing in richness and extent until now it is certain that millions will be taken out of the district in the next few years.

On some of the claims prospected the pay dirt is of great extent and very rich. One man told me yesterday that he washed out a single pan of dirt on one of the claims on Bonanza and found \$14.25 in it. Of course that may be an exceptionally rich pan, but \$5 to \$7 per pan is the average on that claim it is reported, with 5 feet of pay dirt and the width yet undetermined, but it is known to be 30 feet even at that: figure the result at 9 to 10 pans to the cubic foot, and 500 feet long; nearly \$4,000,000 at \$5 per pan—one-fourth of this would be enormous.

Another claim has been prospected to such an extent that it is known there is about 5 feet pay dirt averaging \$2 per pan and width not less than 30 feet. Enough prospecting has been done to show that there are at least 15 miles of this extraordinary richness; and the indications are that we will have 3 or 4 times that extent, if not all equal to the above at least very rich.

It appears a great deal of staking for absentees has been done, some of whom have turned up and some have not. This has caused confusion and leads to a good deal of what might be called fraud, for it is easy for a few in the inner circle to know what claims have been recorded in accordance with the law, and what have not. They can

then for themselves directly or through the intervention of a friend have the latter jumped for their whole or partial interest. It appears this has been done in several instances.

I think the department should get large posters printed on which shall be shown the sections of the law governing the location and recording of quartz and placer mines, the extent of each, the duties of miners in both cases, and the rulings of the department on the questions I have submitted, with the penalties attached to offences against the law. Some of these should be printed on stout paper or parchment capable of standing exposure to the weather, and posted at every important point in the country so that there may be no excuse hereafter for ignorance.

A large number of copies of the Mining Act, Land Act, and timber and hay lands regulations should also be sent in.

As to the extent of mining districts they should I think be made large, and section 21 amended to enable a man who has located a claim which does not pay a reasonable return on outlay the first season after his claim has been prospected, to make a second location in the same locality or district provided he can find one in it. The agent would have to determine whether or not he had expended the proper amount of labour on his claim to get reasonable returns; this I know opens the door for a lot of trouble and may be fraud, but on the other hand a great many worthy men suffer from the want of some such regulation, and as very few would be in a position to take advantage of such a provision until after their second season, there would hardly be anything left for them to take. Enterprising industrious men who would work almost continuously might get some benefit—probably would—but no others, so such a regulation could not do very much harm and might help some deserving people. As it is now men stake claims on nearly every new find, some having several claims in the Thron-Diuck locality. They know, I believe, that they will not be able to hold them, but as the localities are not yet clearly defined they can hold on to them for a while and finally by collusion with others acquire an interest in them.

The miners here are I understand getting up a petition to the Minister asking for aid in opening a way from the south and building along it shelter for winter travellers, with suitable supplies scattered along.

As it is now a winter's trip out from here is on account of the long haul and want of shelter tedious and hazardous, and their representations are worthy of consideration.

CUDAHY, 11th January, 1897.

The reports from the Thron-Diuck region are still very encouraging; so much so that all the other creeks around are practically abandoned, especially those on the head of Forty Mile in American territory, and nearly one hundred men have made their way up from Circle City many of them hauling their sleds themselves. Those who cannot get claims are buying in on those already located. Men cannot be got to work for love or money, and development is consequently slow; one and a half dollars per hour is the wages paid the few men who have to work for hire, and work as many hours as they like. Some of the claims are so rich that every night a few pans of dirt suffices to pay the hired help when there is any: as high as \$204 has been reported to a single pan, but this is not generally credited. Claim owners are now very reticent about what they get, so you can hardly credit anything you hear; but one thing is certain we have one of the richest mining areas ever found, with a fair prospect that we have not yet discovered its limits.

Miller and Glacier Creeks on the head of Sixty Mile River, which my survey of the 141st meridian determined to be in Canada, were thought to be very rich, but they are poor both in quality and quantity compared with Thron-Diuck.

Chicken Creek on the head of Forty Mile, in Alaska, discovered a year ago and rated very high, is to-day practically abandoned.

\* \* \* \* \*

Some quartz prospecting has been done in Thron-Diuck region, and it is probable that some good veins will be found there. Coal is found on the upper part of Thron-Diuck; so that the facilities for working it if found are good and convenient.

\* \* \* \* \*

CUDAHY, 22nd January, 1897.

A quartz lode showing free gold in paying quantities has been located on one of the creeks, but I cannot yet send particulars. I am confident from the nature of the gold found in the creeks that many more of them—and rich too—will be found.

\* \* \* \* \*

CUDAHY, 23rd January, 1897.

I have just heard from a reliable source that the quartz mentioned above is rich, as tested, over one hundred dollars to the ton. The lode appears to run from 3 to 8 feet in thickness and is about 19 miles from the Yukon River. I will likely be called on to survey it, and will be able to report fully.

Placer prospects continue more and more encouraging and extraordinary. It is beyond doubt that 3 pans on different claims on Eldorado turned out \$204, \$212, and \$216; but it must be borne in mind that there were only three such pans, though there are many running from \$10 to \$50.

\* \* \* \* \*

#### EXTRACT FROM INSPECTOR CONSTANTINE'S SUPPLEMENTARY REPORT FOR 1895 DESCRIBING FORT CONSTANTINE.

The work of laying out the site of the post was done on Monday, 29th of July. Then the ground was cleared of trees and brush and the moss stripped off. Ditches were dug on the west, north and east sides, and a large one down the centre of the square. Small side ditches connecting with the main ones were also dug. All this entailed much hard work, and was gone on with regardless of the state of the weather. If it was not 90° in the shade, it was pouring rain. At any time the men were working up to their ankles, and sometimes up to their knees in water. The labour of stripping the moss was particularly severe. It was done in this manner: A strip about three feet in width and the length of the site was cut and then divided into squares, which were then pulled up by the combined strength of three men. This process was continued until a space 150 feet long and 125 feet wide was done. The moss was then wheeled or carried off and dumped over the river bank, where it now lies, waiting for the high water in the spring to sweep it away. Moss is the bane of this part of the country. It varies in thickness from 1 to 3 feet, and immediately under it lies clear white ice.

The ditches were made by clearing off the moss so that the sun could get at the frozen earth and ice underneath. About four or five inches would thaw during the twenty-four hours, and night and morning the ditches were shovelled out.

Thus the work went on till the logging party returned, when it in a measure changed. The logs had to be got out of the water, hewed or sawn square, then carried by the men a distance of about one-third of a mile to the building site. In order to save time I hired the saw-mill from the company, our men doing the work. This was the most economical way, and took less time. We got a certain amount of boards (about 3,000 feet) out of our logs as well as the slabs, which were used for roofing, and for flooring and partitions in some of the buildings, and which otherwise would have had to be purchased at 50 cents each.

The first timbers sawn were the mud-sills from 22 to 35 feet in length, 10 to 14 inches in width and 8 inches in thickness. The N. A. T. & T. Company kindly extended their tramway about 500 feet, which brought it opposite the site. On this tramway was used a small trolley on which we moved the timbers. It was propelled by man power, but even this was a great saving of labour. The timber had then to be carried from 50 to 200 feet, the men wading through mud. After the sills were placed and other timbers sawn, a tramway was built down both sides of the square, a few feet from the line of the buildings.

One by one the buildings went up, first the guard-room 30 x 22, next the barracks, 70 x 22, then the storehouse, including offices 48 x 22, then the officers' quarters, one 35 x 22, the other 33 x 22, next the hospital, 33 x 22, and lastly, quarters for the staff-sergeants and the assistant surgeon, each 16 x 16, eight buildings in all. The roof timbers were put on, also the slabs, which were afterwards mossed and earthed, floors laid, and finally on Monday, 7th October, 1895, the men moved into quarters, the officers about a week later.

Considering that the ground was cleared of trees and brush, stripped of moss and ditched, the logs cut about 30 miles up the river, rafted and floated down, sawn square, carried fully one-third of a mile by the unaided exertions of the men, buildings completed, and all comfortably housed within three months of arrival, it speaks well for the energy and aptitude of the men of the North-west Mounted Police sent to this extreme corner of the Dominion.

It may not be out of place to describe in a minute manner the buildings. They are placed forming a square, the guard-room at the east end, the barracks and staff-sergeants' quarters on the south side, two officers' quarters on the west side, assistant-surgeon's hospital and a building 48 feet long, containing office, stores, carpenter's shop, wash and bath-room, on the north side. The square inside of buildings is 101 x 80 feet. The foundation of the first building was laid 21st of August. The logs are 7 inches in thickness, halved at the corners, pinned and spiked. The roofs of all the buildings are self-supporting, being trussed roofs formed of tie beams, principal rafters, king-posts and struts. The barrack building is divided into three compartments, viz.: barrack room, 35 x 22, mess-room, 25 x 22, and kitchen, 10 x 22. The guard-room is 30 x 22, built in the same manner. On the 30th August, a building 48 x 22 was commenced. This building is divided into four compartments, viz.: office, store-room, carpenter's shop and wash room. On the 10th September, the officers' quarters were begun and are divided into three, viz.: kitchen, living and sleeping rooms. The hospital was next in order, and will accommodate 8 patients. The sergeants' quarters were started on the 4th, and the assistant surgeon's on the 7th October. These latter buildings are each 16 x 16 with 7 ft. 6 in. walls. The officers' quarters have 9 ft. 6 in. walls.

All the buildings are roofed with slabs with moss in the interstices, and covered with earth, or the best part of the moss stripped off the site. The timber used in the construction of the buildings was spruce. It checks and twists very badly, owing to the cross grain. The logs in the men's quarters, guard-room and storehouse, are 7 inches in thickness, in the other buildings they are 6 inches. The posts were morticed into the sills at equal distances, so as to utilize the logs to the best advantage. The logs are tenoned into the posts, halved at the corners, pinned and spiked. Moss was laid between each log for filling.

The dimensions of the roof-timbers are as follows:—

	in. in.
Purloins.....	8 x 8
Tie-beams .....	8 x 8
Rafters .....	4 x 8
Struts.....	4 x 8

These may appear large, but the weight of green slabs and earth is great, and extra strength is essential for safety.



This table will give in a condensed form the quantities of material used :—

	No. of logs.	Lumber for floors, etc.	No. of Windows.	Doors.	Par- titions.
Barrack building.....	170	2,100	7	2	2
Guard-room.....	130	700	2	1	
Sergeant's quarters.....	60	260	2	1	
Inspector Constantine's quarters.....	114	1,300	4	2	2
Inspector Strickland's quarters.....	130	1,176	3	2	2
Assistant Surgeon's quarters.....	60	260	2	1	
Storehouse.....	170	1,144	3	3	3
Hospital.....	130	1,200	2	1	2
	964	8,140	25	13	11

There are no windows in the rear walls of any of the buildings. Slabs were used for the floors and partitions in the building containing the store-room, carpenter shop, wash-room and office, the latter part having a floor made of the culls of boards. The windows are all double. For the officers' quarters and hospital, windows (glazed) had to be purchased. Porches of slabs were built over the doors of all the buildings except the 48 foot building and the guard-room. It is intended in the spring to put one over the latter as well as a platform in front, and also to build a sidewalk of slabs around the square, as the ground will be very wet for a couple of seasons. All the quarters will require a second floor for warmth on account of the cold and damp on the ground, also from the shrinkage in the present one.

A stockade of small logs (which were got out later) has been built along the front and for the 22 feet between the men's quarters and the bastion. There are two bastions, each 10 x 10. At the south-east one is a flag staff 50 feet high. The intervals between the buildings are filled with heavy slabs, one end sunk in a trench, the other spiked to strong posts with stringers. It is proposed in the spring, if approved, to build a stockade around the west end and north side at a distance from the rear of the buildings of about 40 feet, which will give ample room for the erection of any small building which may be necessary.

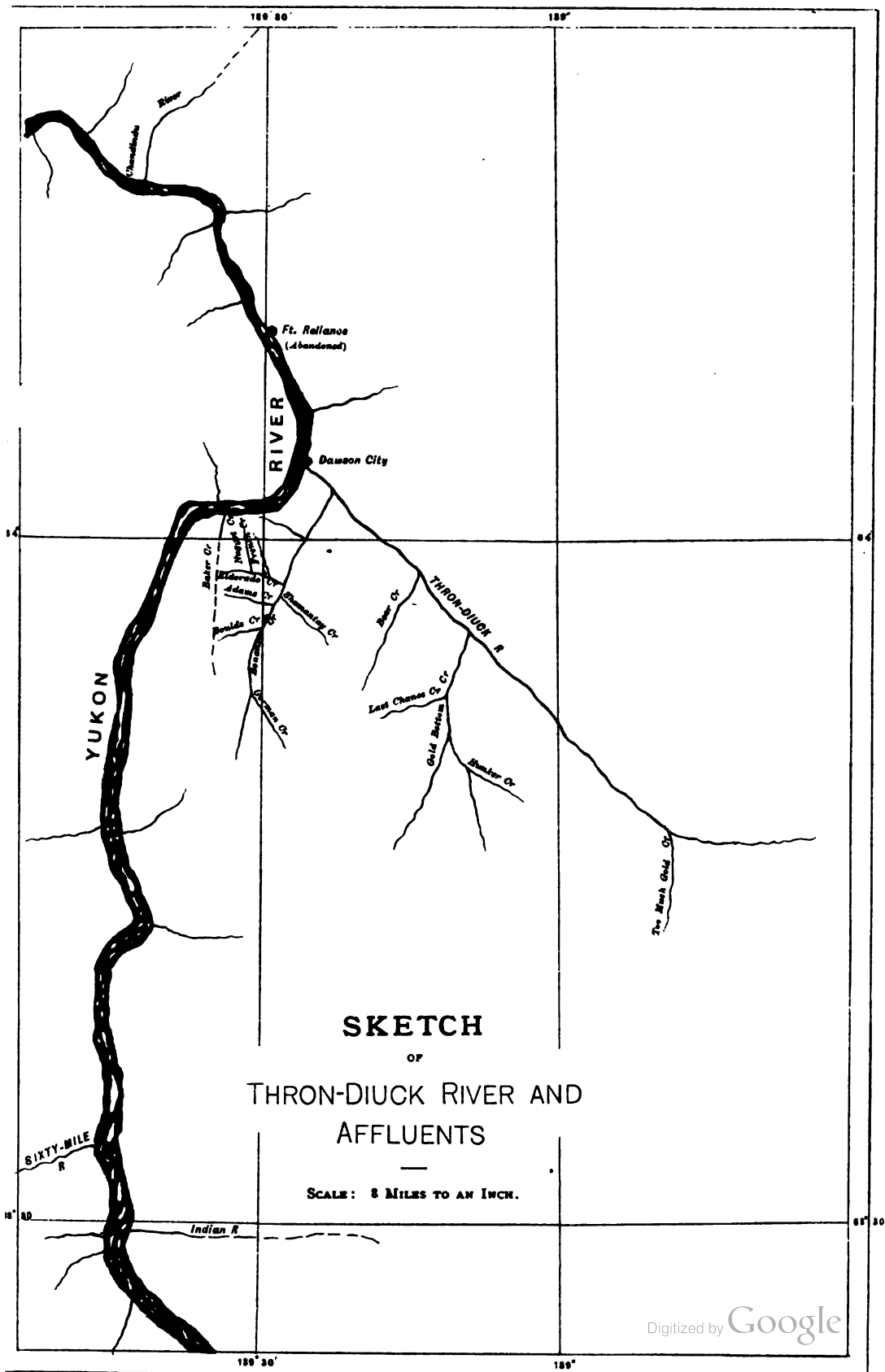
The buildings are provided with ventilators, and excepting the cold coming through the floors which is mostly felt on windy days or nights, are warm and comfortable. All the buildings will require, in the spring, recalking with moss as well as four or five inches more earth on the roofs, to keep out the spring rains. The lateness of our arrival here along with early freezing prevented more than a very small depth of earth being put on, and in consequence when a fall of snow came, with a week or ten days warm weather following, considerable discomfort was caused by the roofs leaking. The buildings being of green logs, "sweated" considerably. Over 2,000 slabs were used in the construction of the post.

#### EXTRACT FROM ASSISTANT SURGEON A. E. WILLS' REPORT FOR 1895.

It may be of interest to mention something concerning the climate, mode of living of the people generally, and diseases met with.

✕ The climate is wet. The rainfall last summer was heavy. Although there is almost a continuous sun in summer time evaporation is very slow owing to the thick moss which will not conduct the heat, in consequence the ground is always swampy. It is only after several years of draining that ground will become sufficiently dry to allow the frost to go out and then only for a few feet. During the winter months the cold is intense with usually considerable wind.







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A heavy mist rising from open places in the river settles down in the valley in calm extreme weather. This dampness makes the cold to be felt much more and is conducive to rheumatic pains, colds, etc.

✕ Miners are a very mixed class of people. They represent many nationalities and come from all climates. Their lives are certainly not enviable. The regulation "miners' cabin" is 12 feet by 14 feet with walls 6 feet and gables 8 feet in height. The roof is heavily earthed and the cabin is generally very warm. Two, and sometimes three or four men will occupy a house of this size. The ventilation is usually bad. Those miners who do not work their claims during the winter confine themselves in these small huts most of the time.

Very often they become indolent and careless, only eating those things which are most easily cooked or prepared. During the busy time in summer when they are "shovelling in," they work hard and for long hours, sparing little time for eating and much less for cooking.

This manner of living is quite common amongst beginners, and soon leads to debility and sometimes to scurvy. Old miners have learned from experience to value health more than gold, and they therefore spare no expense in procuring the best and most varied outfit of food that can be obtained.✕

In a cold climate such as this, where it is impossible to get fresh vegetables and fruits, it is most important that the best substitutes for these should be provided. Nature helps to supply these wants by growing cranberries and other wild fruits in abundance, but men in summer are usually too busy to avail themselves of these.

✕ The diseases met with in this country are dyspepsia, anæmia, scurvy caused by improperly cooked food, sameness of diet, overwork, want of fresh vegetables, overheated and badly ventilated houses; rheumatism, pneumonia, bronchitis, enteritis, cystitis and other acute diseases, from exposure to wet and cold; debility and chronic diseases, due to excesses. Venereal diseases are not uncommon.✕ One case of typhoid fever occurred in Forty Mile last fall probably due to drinking water polluted with decayed vegetable matter.

In selecting men to relieve in this country I beg to submit a few remarks, some of which will be of assistance to the medical examiners in making their recommendations.

Men should be sober, strong and healthy. They should be practical men, able to adapt themselves quickly to their surroundings. Special care should be taken to see that their lungs are sound, that they are free from rheumatism and rheumatic tendency, and that their joints, especially knee joints are strong and have never been weakened by injury, synovitis or other disease. It is also very important to consider their temperaments. Men should be of cheerful, hopeful dispositions and willing workers. Those of sullen, morose natures, although they may be good workers, are very apt, as soon as the novelty of the country wears off, to become dissatisfied, pessimistic and melancholy.









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